The physconst package*

Brian W. Mulligan
bwmulligan@astronaos.com

March 26, 2021

1 Introduction

This package consists of several macros that are shorthand for a variety of physical constants, e.g. the speed of light. The package developed out of physics and astronomy classes that I have taught and wanted to ensure that I had correct values for each constant and did not wish to retype them every time I use them. The constants can be used in two forms, the most accurate available values, or versions that are rounded to 3 significant digits for use in typical classroom settings, homework assignments, etc.

Most constants are taken from CODATA 2018, with the exception of the astronomical objects, whose values are taken from International Astronomical Union specified values. Constants that are derived from true constants, e.g. the fine structure constant, have been calculated using the accepted values of the fundamental constants.

1.1 Options

There are three options available: `shortconst`, `cgs`, and `unseparatedecimals`. They can be invoked when the package is declared, e.g.
`\usepackage[shortconst]{physconst}`.

`shortconst` will reduce the precision to 3 digits for all constants. This is intended when you don't want to have the details of the constants, just the general value (e.g. $1.60 \times 10^{-19}\,\mathrm{C}$ instead of $1.602\,176\,634 \times 10^{-19}\,\mathrm{C}$).

`cgs` will provide all constants in cgs, i.e. the units used in astronomy.

*This document corresponds to physconst v1.1.2, dated 2021/03/26.

`unseparatedecimals` is for situations when you don't want spaces in the decimal portion of full precision constants. E.g. the elementary charge would appear as $1.602176634 \times 10^{-19}$ C instead of $1.602\,176\,634 \times 10^{-19}$ C. (notice the gaps between digits in the latter.)

2 Prerequisites / Dependencies

2.1 General

This package requires the `physunits` package.

2.2 Generating Documentation

`hyperref`, `xcolor`, `mdframed`, and `imakeidx` packages are required to generate the documentation (this file) for this package.

3 Acknowledgements

The author would like to thank Dr. Florian Leupold for catching a glaring error in the shortconst option, and M. Kloske for catching a typo in Avogadro's Number.

4 Bug Reporting

Please report bugs or issues in this package using github, at `https://github.com/astrobit/physconst/issues`.

5 Macros

5.1 Normal Macros

The normal macros are the ones that you will typically use, whose values are determined by the choice of options when the package is invoked.

5.1.1 Naming Convention

Each macro starts with a lower case 'k' to indicate that it is a constant. If the macro is of special units, e.g. eV, those units will be specified next. If the macro is part of a fundamental unit group, it then gets the name of the group, e.g. Mass, Charge, etc. Finally is the details or name of the constants, e.g. Proton, Planck, etc.

5.1.2 Mass

`\kMassElectron` `\kMassElectron` is the mass of an electron.

`\keVMassElectron` `\keVMassElectron` is the mass of an electron.

`\kMassElectronNumeric` `\kMassElectronNumeric` is the numeric value of the mass of an electron.

`\keVMassElectronNumeric` `\keVMassElectronNumeric` is the numeric value of the mass of an electron.

`\kMassProton` `\kMassProton` is the mass of a proton.

`\keVMassProton` `\keVMassProton` is the mass of a proton.

`\kMassProtonNumeric` `\kMassProtonNumeric` is the numeric value of the mass of a proton.

`\keVMassProtonNumeric` `\keVMassProtonNumeric` is the numeric value of the mass of a proton.

`\kMassHydrogen` `\kMassHydrogen` is the mass of a neutral hydrogen atom.

`\keVMassHydrogen` `\keVMassHydrogen` is the mass of a neutral hydrogen atom.

`\kMassHydrogenNumeric` `\kMassHydrogenNumeric` is the numeric value of the mass of a neutral hydrogen atom.

`\keVMassHydrogenNumeric` `\keVMassHydrogenNumeric` is the numeric value of the mass of a neutral hydrogen atom.

`\kMassSun` `\kMassSun` is the mass of the Sun.

`\kMassSunNumeric` `\kMassSunNumeric` is the numeric value of the mass of the Sun.

`\kMassEarth` `\kMassEarth` is the mass of the Earth.

`\kMassEarthNumeric` `\kMassEarthNumeric` is the numeric value of the mass of the Earth.

`\kMassJupiter` `\kMassJupiter` is the mass of Jupiter.

`\kMassJupiterNumeric` `\kMassJupiterNumeric` is the numeric value of the mass of Jupiter.

`\kMassAMU` `\kMassAMU` is the mass of an atomic mass unit.

`\keVMassAMU` `\keVMassAMU` is the mass of an atomic mass unit.

`\kMassAMUNumeric` `\kMassAMUNumeric` is the numeric value of the mass of an atomic mass unit.

`\keVMassAMUNumeric` `\keVMassAMUNumeric` is the numeric value of the mass of an atomic mass unit.

5.1.3 Charge

`\kChargeFundamental` `\kChargeFundamental` is the fundamental charge.

`\kChargeFundamentalNumeric` `\kChargeFundamentalNumeric` is the numeric value of the fundamental charge.

`\kChargeElectron` `\kChargeElectron` is the charge of an electron.

`\kChargeElectronNumeric` `\kChargeElectronNumeric` is the numeric value of the charge of an electron.

`\kChargeProton` `\kChargeProton` is the charge of a proton.

`\kChargeProtonNumeric` `\kChargeProtonNumeric` is the numeric value of the charge of a proton.

5.1.4 Distances and Lengths

`\kRadiusBohr` `\kRadiusBohr` is Bohr radius of an atom.

`\kRadiusBohrNumeric` `\kRadiusBohrNumeric` is the numeric value of Bohr radius of an atom.

`\kAstronomicalUnit` `\kAstronomicalUnit` is the astronomical unit (the average distance between the Earth and the Sun).

`\kAstronomicalUnitNumeric` `\kAstronomicalUnitNumeric` is the numeric value of the astronomical unit (the average distance between the Earth and the Sun).

`\kParsec` `\kParsec` is the length of a parsec ($\frac{648000\,\mathrm{au}}{\pi}$).

`\kParsecNumeric` `\kParsecNumeric` is the numeric value of the length of a parsec ($\frac{648000\,\mathrm{au}}{\pi}$).

`\kRadiusSun` `\kRadiusSun` is the mean radius of the Sun.

`\kRadiusSunNumeric` `\kRadiusSunNumeric` is the numeric value of the mean radius of the Sun.

`\kRadiusEarth` `\kRadiusEarth` is the mean radius of the Earth.

`\kRadiusEarthNumeric` `\kRadiusEarthNumeric` is the numeric value of the mean radius of the Earth.

\kRadiusJupiter \kRadiusJupiter is the mean radius of Jupiter.

\kRadiusJupiterNumeric \kRadiusJupiterNumeric is the numeric value of the mean radius of Jupiter.

5.1.5 Energy, Power, and Luminosity

\kRydberg \kRydberg is the Rydberg energy (the binding energy of Hydrogen).

\keVRydberg \keVRydberg is the Rydberg energy (the binding energy of Hydrogen).

\kRydbergNumeric \kRydbergNumeric is the numeric value of the Rydberg energy (the binding energy of Hydrogen).

\keVRydbergNumeric \keVRydbergNumeric is the numeric value of the Rydberg energy (the binding energy of Hydrogen).

\kLuminositySun \kLuminositySun is the luminosity of the Sun.

\kLuminositySunNumeric \kLuminositySunNumeric is the numeric value of the luminosity of the Sun.

5.1.6 Pressure

\kPressureAtmosphere \kPressureAtmosphere is the standard atmospheric pressure.

\kPressureAtmosphereNumeric \kPressureAtmosphereNumeric is the numeric value of the standard atmospheric pressure.

\kPressureStandard \kPressureStandard is the standard atmospheric pressure.

\kPressureStandardNumeric \kPressureStandardNumeric is the numeric value of the standard atmospheric pressure.

5.1.7 Velocity, Speed and Acceleration

\kSpeedLight \kSpeedLight is the speed of light.

\kSpeedLightNumeric \kSpeedLightNumeric is the numeric value of the speed of light.

\kAccelGravity \kAccelGravity is the accelertion due to gravity at the surface of the Earth.

\kAccelGravityNumeric \kAccelGravityNumeric is the numeric value of the accelertion due to gravity at the surface of the Earth.

5.1.8 Other Constants

`\kCoulomb` `\kCoulomb` is the Coulomb constant ($\frac{1}{4\pi\epsilon_0}$).

`\kCoulombNumeric` `\kCoulombNumeric` is the numeric value of the Coulomb constant ($\frac{1}{4\pi\epsilon_0}$).

`\kVacuumPermittivity` `\kVacuumPermittivity` is the electric permittivity of the vacuum.

`\kVacuumPermittivityNumeric` `\kVacuumPermittivityNumeric` is the numeric value of the electric permittivity of the vacuum.

`\kVacuumPermeability` `\kVacuumPermeability` is the magnetic permeability of the vacuum.

`\kVacuumPermeabilityNumeric` `\kVacuumPermeabilityNumeric` is the numeric value of the magnetic permeability of the vacuum.

`\kVacuumImpedance` `\kVacuumImpedance` is the characteristic impedance of the vacuum.

`\kVacuumImpedanceNumeric` `\kVacuumImpedanceNumeric` is the numeric value of the characteristic impedance of the vacuum.

`\kBoltzmann` `\kBoltzmann` is the Boltzmann constant.

`\keVBoltzmann` `\keVBoltzmann` is the Boltzmann constant.

`\kBoltzmannNumeric` `\kBoltzmannNumeric` is the numeric value of the Boltzmann constant.

`\keVBoltzmannNumeric` `\keVBoltzmannNumeric` is the numeric value of the Boltzmann constant.

`\kPlanck` `\kPlanck` is the Planck constant.

`\keVPlanck` `\keVPlanck` is the Planck constant.

`\kPlanckNumeric` `\kPlanckNumeric` is the numeric value of the Planck constant.

`\keVPlanckNumeric` `\keVPlanckNumeric` is the numeric value of the Planck constant.

`\kPlanckReduced` `\kPlanckReduced` is the Reduced Planck constant $\left(\frac{h}{2\pi}\right)$.

`\keVPlanckReduced` `\keVPlanckReduced` is the Reduced Planck constant $\left(\frac{h}{2\pi}\right)$.

`\kPlanckReducedNumeric` `\kPlanckReducedNumeric` is the numeric value of the Reduced Planck constant $\left(\frac{h}{2\pi}\right)$.

`\keVPlanckReducedNumeric` `\keVPlanckReducedNumeric` is the numeric value of the Reduced Planck constant $\left(\frac{h}{2\pi}\right)$.

`\kGravity` `\kGravity` is Newton's gravitational constant.

`\kGravityNumeric` `\kGravityNumeric` is the numeric value of Newton's gravitational constant.

`\kStefanBoltzmann` `\kStefanBoltzmann` is the Stefan-Boltzmann blackbody constant $\left(\frac{2\pi^5 k_B}{15h^3c^2}\right)$.

`\kStefanBoltzmannNumeric` `\kStefanBoltzmannNumeric` is the numeric value of the Stefan-Boltzmann blackbody constant $\left(\frac{2\pi^5 k_B}{15h^3c^2}\right)$.

`\kRadiation` `\kRadiation` is the radiation constant, $a\left(\frac{8\pi^5 k_B^4}{15c^3h^3}\right)$.

`\kRadiationNumeric` `\kRadiationNumeric` is the numeric value of the radiation constant, $a\left(\frac{8\pi^5 k_B^4}{15c^3h^3}\right)$.

`\kFineStructure` `\kFineStructure` is the fine structure constant.

`\kFineStructureNumeric` `\kFineStructureNumeric` is the numeric value of the fine structure constant.

`\kFineStructureReciprocal` `\kFineStructureReciprocal` is the reciprocal of the fine structure constant.

`\kFineStructureReciprocalNumeric` `\kFineStructureReciprocalNumeric` is the numeric value of the reciprocal of the fine structure constant.

`\kAvogadro` `\kAvogadro` is Avogadro's Number (the number of particles in a mole).

`\kAvogadroNumeric` `\kAvogadroNumeric` is the numeric value of Avogadro's Number (the number of particles in a mole).

5.2 Detailed Macros

These macros are used to access the constants with specific units and precision. They require use of \makeatletter and \makeatother in order to be used. They are used internally by physconst to define the macros that are normally used (those described above.

5.2.1 NamingConvention

The detailed macros are named like @units@precision@name. The units specify which units the constant is in (SI, cgs, or eV). For constants that are independent of the unit system (e.g. Avogadro's number and the fine structure constant), the units are omitted. The precision is either 'short' or 'full' to indicate how much precision is included in the number. All short precision constants have 3 significant figures. The precision of full precision constants vary by their definition and/or inputs. Finally, the name or description of the constant appears.

5.2.2 Mass

\k@SI@short@MassElectron

\k@SI@short@MassElectron is the mass of an electron in SI units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@short@MassElectron
\makeatother
```

Resulting in

The value is $9.11 \times 10^{-31}\,\mathrm{kg}$

\k@SI@full@MassElectron

\k@SI@full@MassElectron is the mass of an electron in SI units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@full@MassElectron
\makeatother
```

Resulting in

The value is $9.109\,383\,701\,500 \times 10^{-31}\,\mathrm{kg}$

\k@cgs@short@MassElectron

\k@cgs@short@MassElectron is the mass of an electron in cgs units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@short@MassElectron
\makeatother
```

Resulting in

The value is $9.11 \times 10^{-28}\,\mathrm{g}$

\k@cgs@full@MassElectron

\k@cgs@full@MassElectron is the mass of an electron in cgs units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@full@MassElectron
\makeatother
```

Resulting in

The value is $9.109\,383\,701\,500 \times 10^{-28}\,\mathrm{g}$

`\k@eV@short@MassElectron` `\k@eV@short@MassElectron` is the mass of an electron in eV with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@eV@short@MassElectron
\makeatother
```

Resulting in

The value is $5.11 \times 10^{5}\,\mathrm{eV}\,c^{-2}$

`\k@eV@full@MassElectron` `\k@eV@full@MassElectron` is the mass of an electron in eV with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@eV@full@MassElectron
\makeatother
```

Resulting in

The value is $5.109\,989\,499\,962 \times 10^{5}\,\mathrm{eV}\,c^{-2}$

`\k@SI@short@MassElectronNumeric` `\k@SI@short@MassElectronNumeric` is a mathematical value of the mass of an electron in SI units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@short@MassElectronNumeric
\makeatother
```

Resulting in

The value is $9.11e-31$

\k@SI@full@MassElectronNumeric `\k@SI@full@MassElectronNumeric` is a mathematical value of the mass of an electron in SI units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@full@MassElectronNumeric
\makeatother
```

Resulting in

The value is $9.109383701500e-31$

\k@cgs@short@MassElectronNumeric `\k@cgs@short@MassElectronNumeric` is a mathematical value of the mass of an electron in cgs units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@short@MassElectronNumeric
\makeatother
```

Resulting in

The value is $9.11e-28$

\k@cgs@full@MassElectronNumeric `\k@cgs@full@MassElectronNumeric` is a mathematical value of the mass of an electron in cgs units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@full@MassElectronNumeric
\makeatother
```

Resulting in

The value is $9.109383701500e-28$

\k@eV@short@MassElectronNumeric `\k@eV@short@MassElectronNumeric` is a mathematical value of the mass of an electron in eV with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@eV@short@MassElectronNumeric
\makeatother
```

Resulting in

The value is $5.11e+05$

`\k@eV@full@MassElectronNumeric` `\k@eV@full@MassElectronNumeric` is a mathematical value of the mass of an electron in eV with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@eV@full@MassElectronNumeric
\makeatother
```

Resulting in

The value is $5.109989499962e+05$

`\k@SI@short@MassProton` `\k@SI@short@MassProton` is the mass of a proton in SI units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@short@MassProton
\makeatother
```

Resulting in

The value is $1.67 \times 10^{-27}\,\mathrm{kg}$

`\k@SI@full@MassProton` `\k@SI@full@MassProton` is the mass of a proton in SI units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@full@MassProton
\makeatother
```

Resulting in

The value is $1.672\,621\,923\,690 \times 10^{-27}\,\mathrm{kg}$

`\k@cgs@short@MassProton` `\k@cgs@short@MassProton` is the mass of a proton in cgs units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@short@MassProton
\makeatother
```

Resulting in

The value is $1.67 \times 10^{-24}\,\mathrm{g}$

`\k@cgs@full@MassProton` `\k@cgs@full@MassProton` is the mass of a proton in cgs units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@full@MassProton
\makeatother
```

Resulting in

The value is $1.672\,621\,923\,690 \times 10^{-24}\,\mathrm{g}$

`\k@eV@short@MassProton` `\k@eV@short@MassProton` is the mass of a proton in eV with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@eV@short@MassProton
\makeatother
```

Resulting in

The value is $9.38 \times 10^{8}\,\mathrm{eV}\,c^{-2}$

`\k@eV@full@MassProton` `\k@eV@full@MassProton` is the mass of a proton in eV with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@eV@full@MassProton
\makeatother
```

Resulting in

The value is $9.382\,720\,881\,605 \times 10^{8}\,\mathrm{eV}\,c^{-2}$

`\k@SI@short@MassProtonNumeric` `\k@SI@short@MassProtonNumeric` is a mathematical value of the mass of a proton in SI units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@short@MassProtonNumeric
\makeatother
```

Resulting in

The value is $1.67e-27$

`\k@SI@full@MassProtonNumeric` `\k@SI@full@MassProtonNumeric` is a mathematical value of the mass of a proton in SI units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@full@MassProtonNumeric
\makeatother
```

Resulting in

The value is $1.672621923690e-27$

`\k@cgs@short@MassProtonNumeric` `\k@cgs@short@MassProtonNumeric` is a mathematical value of the mass of a proton in cgs units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@short@MassProtonNumeric
\makeatother
```

Resulting in

The value is $1.67e-24$

\k@cgs@full@MassProtonNumeric `\k@cgs@full@MassProtonNumeric` is a mathematical value of the mass of a proton in cgs units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@full@MassProtonNumeric
\makeatother
```

Resulting in

The value is $1.672621923690e-24$

\k@eV@short@MassProtonNumeric `\k@eV@short@MassProtonNumeric` is a mathematical value of the mass of a proton in eV with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@eV@short@MassProtonNumeric
\makeatother
```

Resulting in

The value is $9.38e+08$

\k@eV@full@MassProtonNumeric `\k@eV@full@MassProtonNumeric` is a mathematical value of the mass of a proton in eV with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@eV@full@MassProtonNumeric
\makeatother
```

Resulting in

The value is $9.382720881605e+08$

\k@SI@short@MassHydrogen `\k@SI@short@MassHydrogen` is the mass of a neutral hydrogen atom in SI units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@short@MassHydrogen
\makeatother
```

Resulting in

The value is $1.67 \times 10^{-27}\,\mathrm{kg}$

`\k@SI@full@MassHydrogen` `\k@SI@full@MassHydrogen` is the mass of a neutral hydrogen atom in SI units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@full@MassHydrogen
\makeatother
```

Resulting in

The value is $1.673\,532\,837\,806 \times 10^{-27}\,\mathrm{kg}$

`\k@cgs@short@MassHydrogen` `\k@cgs@short@MassHydrogen` is the mass of a neutral hydrogen atom in cgs units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@short@MassHydrogen
\makeatother
```

Resulting in

The value is $1.67 \times 10^{-24}\,\mathrm{g}$

`\k@cgs@full@MassHydrogen` `\k@cgs@full@MassHydrogen` is the mass of a neutral hydrogen atom in cgs units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@full@MassHydrogen
\makeatother
```

Resulting in

The value is $1.673\,532\,837\,806 \times 10^{-24}\,\mathrm{g}$

`\k@eV@short@MassHydrogen` `\k@eV@short@MassHydrogen` is the mass of a neutral hydrogen atom in eV with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@eV@short@MassHydrogen
\makeatother
```

Resulting in

The value is $9.39 \times 10^{8}\,\mathrm{eV}\,c^{-2}$

`\k@eV@full@MassHydrogen` `\k@eV@full@MassHydrogen` is the mass of a neutral hydrogen atom in eV with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@eV@full@MassHydrogen
\makeatother
```

Resulting in

The value is $9.387\,830\,735\,048 \times 10^{8}\,\mathrm{eV}\,c^{-2}$

`\k@SI@short@MassHydrogenNumeri` `\k@SI@short@MassHydrogenNumeric` is a mathematical value of the mass of a neutral hydrogen atom in SI units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@short@MassHydrogenNumeric
\makeatother
```

Resulting in

The value is $1.67e-27$

`\k@SI@full@MassHydrogenNumeric` `\k@SI@full@MassHydrogenNumeric` is a mathematical value of the mass of a neutral hydrogen atom in SI units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@full@MassHydrogenNumeric
\makeatother
```

Resulting in

The value is $1.673532837806e-27$

\k@cgs@short@MassHydrogenNumeric `\k@cgs@short@MassHydrogenNumeric` is a mathematical value of the mass of a neutral hydrogen atom in cgs units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@short@MassHydrogenNumeric
\makeatother
```

Resulting in

The value is $1.67e-24$

\k@cgs@full@MassHydrogenNumeric `\k@cgs@full@MassHydrogenNumeric` is a mathematical value of the mass of a neutral hydrogen atom in cgs units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@full@MassHydrogenNumeric
\makeatother
```

Resulting in

The value is $1.673532837806e-24$

\k@eV@short@MassHydrogenNumeric `\k@eV@short@MassHydrogenNumeric` is a mathematical value of the mass of a neutral hydrogen atom in eV with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@eV@short@MassHydrogenNumeric
\makeatother
```

Resulting in

The value is $9.39e+08$

\k@eV@full@MassHydrogenNumeric `\k@eV@full@MassHydrogenNumeric` is a mathematical value of the mass of a neutral hydrogen atom in eV with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@eV@full@MassHydrogenNumeric
\makeatother
```

Resulting in

The value is $9.387830735048e+08$

\k@SI@short@MassSun `\k@SI@short@MassSun` is the mass of the Sun in SI units with reduced precision. (IAU Resolution B3 2015)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@short@MassSun
\makeatother
```

Resulting in

The value is $1.99 \times 10^{30}\,\mathrm{kg}$

\k@SI@full@MassSun `\k@SI@full@MassSun` is the mass of the Sun in SI units with full precision. (IAU Resolution B3 2015)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@full@MassSun
\makeatother
```

Resulting in

The value is $1.988\,409\,9 \times 10^{30}\,\mathrm{kg}$

\k@cgs@short@MassSun `\k@cgs@short@MassSun` is the mass of the Sun in cgs units with reduced precision. (IAU Resolution B3 2015)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@short@MassSun
\makeatother
```

Resulting in

The value is $1.99 \times 10^{33}\,\mathrm{g}$

`\k@cgs@full@MassSun` `\k@cgs@full@MassSun` is the mass of the Sun in cgs units with full precision. (IAU Resolution B3 2015)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@full@MassSun
\makeatother
```

Resulting in

The value is $1.988\,409\,9 \times 10^{33}\,\mathrm{g}$

`\k@SI@short@MassSunNumeric` `\k@SI@short@MassSunNumeric` is a mathematical value of the mass of the Sun in SI units with reduced precision. (IAU Resolution B3 2015)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@short@MassSunNumeric
\makeatother
```

Resulting in

The value is $1.99e+30$

`\k@SI@full@MassSunNumeric` `\k@SI@full@MassSunNumeric` is a mathematical value of the mass of the Sun in SI units with full precision. (IAU Resolution B3 2015)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@full@MassSunNumeric
\makeatother
```

Resulting in

The value is $1.9884099e+30$

`\k@cgs@short@MassSunNumeric` `\k@cgs@short@MassSunNumeric` is a mathematical value of the mass of the Sun in cgs units with reduced precision. (IAU Resolution B3 2015)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@short@MassSunNumeric
\makeatother
```

Resulting in

The value is $1.99e+33$

`\k@cgs@full@MassSunNumeric` `\k@cgs@full@MassSunNumeric` is a mathematical value of the mass of the Sun in cgs units with full precision. (IAU Resolution B3 2015)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@full@MassSunNumeric
\makeatother
```

Resulting in

The value is $1.9884099e+33$

`\k@short@MassEarth` `\k@short@MassEarth` is the mass of the Earth with reduced precision. (IAU Resolution B3 2015)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@short@MassEarth
\makeatother
```

Resulting in

The value is $5.97 \times 10^{24}\,\mathrm{kg}$

`\k@full@MassEarth` `\k@full@MassEarth` is the mass of the Earth with full precision. (IAU Resolution B3 2015)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@full@MassEarth
\makeatother
```

Resulting in

The value is $5.972\,168 \times 10^{24}\,\mathrm{kg}$

`\k@short@MassEarthNumeric` `\k@short@MassEarthNumeric` is a mathematical value of the mass of the Earth with reduced precision. (IAU Resolution B3 2015)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@short@MassEarthNumeric
\makeatother
```

Resulting in

The value is $5.97e+24$

`\k@full@MassEarthNumeric` `\k@full@MassEarthNumeric` is a mathematical value of the mass of the Earth with full precision. (IAU Resolution B3 2015)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@full@MassEarthNumeric
\makeatother
```

Resulting in

The value is $5.972168e+24$

`\k@short@MassJupiter` `\k@short@MassJupiter` is the mass of Jupiter with reduced precision. (IAU Resolution B3 2015)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@short@MassJupiter
\makeatother
```

Resulting in

The value is $1.90 \times 10^{27}\,\mathrm{kg}$

`\k@full@MassJupiter` `\k@full@MassJupiter` is the mass of Jupiter with full precision. (IAU Resolution B3 2015)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@full@MassJupiter
\makeatother
```

Resulting in

The value is $1.898\,124\,6 \times 10^{27}\,\mathrm{kg}$

`\k@short@MassJupiterNumeric` `\k@short@MassJupiterNumeric` is a mathematical value of the mass of Jupiter with reduced precision. (IAU Resolution B3 2015)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@short@MassJupiterNumeric
\makeatother
```

Resulting in

The value is $1.90e+27$

`\k@full@MassJupiterNumeric` `\k@full@MassJupiterNumeric` is a mathematical value of the mass of Jupiter with full precision. (IAU Resolution B3 2015)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@full@MassJupiterNumeric
\makeatother
```

Resulting in

The value is $1.8981246e+27$

`\k@SI@short@MassAMU` `\k@SI@short@MassAMU` is the mass of an atomic mass unit in SI units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@short@MassAMU
\makeatother
```

Resulting in

The value is $1.66 \times 10^{-27}\,\mathrm{kg}$

`\k@SI@full@MassAMU` `\k@SI@full@MassAMU` is the mass of an atomic mass unit in SI units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@full@MassAMU
\makeatother
```

Resulting in

The value is $1.660\,539\,066\,600 \times 10^{-27}\,\mathrm{kg}$

`\k@cgs@short@MassAMU` `\k@cgs@short@MassAMU` is the mass of an atomic mass unit in cgs units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@short@MassAMU
\makeatother
```

Resulting in

The value is $1.66 \times 10^{-24}\,\mathrm{g}$

`\k@cgs@full@MassAMU` `\k@cgs@full@MassAMU` is the mass of an atomic mass unit in cgs units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@full@MassAMU
\makeatother
```

Resulting in

The value is $1.660\,539\,066\,600 \times 10^{-24}\,\mathrm{g}$

`\k@eV@short@MassAMU` `\k@eV@short@MassAMU` is the mass of an atomic mass unit in eV with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@eV@short@MassAMU
\makeatother
```

Resulting in

The value is $9.31 \times 10^{8}\,\mathrm{eV}\,c^{-2}$

`\k@eV@full@MassAMU` `\k@eV@full@MassAMU` is the mass of an atomic mass unit in eV with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@eV@full@MassAMU
\makeatother
```

Resulting in

The value is $9.314\,941\,024\,171 \times 10^{8}\,\mathrm{eV}\,c^{-2}$

`\k@SI@short@MassAMUNumeric` `\k@SI@short@MassAMUNumeric` is a mathematical value of the mass of an atomic mass unit in SI units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@short@MassAMUNumeric
\makeatother
```

Resulting in

The value is $1.66e-27$

`\k@SI@full@MassAMUNumeric` `\k@SI@full@MassAMUNumeric` is a mathematical value of the mass of an atomic mass unit in SI units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@full@MassAMUNumeric
\makeatother
```

Resulting in

The value is $1.660539066600e-27$

`\k@cgs@short@MassAMUNumeric` `\k@cgs@short@MassAMUNumeric` is a mathematical value of the mass of an atomic mass unit in cgs units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@short@MassAMUNumeric
\makeatother
```

Resulting in

The value is $1.66e-24$

`\k@cgs@full@MassAMUNumeric` `\k@cgs@full@MassAMUNumeric` is a mathematical value of the mass of an atomic mass unit in cgs units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@full@MassAMUNumeric
\makeatother
```

Resulting in

The value is $1.660539066600e-24$

`\k@eV@short@MassAMUNumeric` `\k@eV@short@MassAMUNumeric` is a mathematical value of the mass of an atomic mass unit in eV with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@eV@short@MassAMUNumeric
\makeatother
```

Resulting in

The value is $9.31e+08$

\k@eV@full@MassAMUNumeric `\k@eV@full@MassAMUNumeric` is a mathematical value of the mass of an atomic mass unit in eV with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@eV@full@MassAMUNumeric
\makeatother
```

Resulting in

The value is $9.314941024171e+08$

5.2.3 Charge

\k@SI@short@ChargeFundamental `\k@SI@short@ChargeFundamental` is the fundamental charge in SI units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@short@ChargeFundamental
\makeatother
```

Resulting in

The value is $1.60 \times 10^{-19}\,\mathrm{C}$

\k@SI@full@ChargeFundamental `\k@SI@full@ChargeFundamental` is the fundamental charge in SI units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@full@ChargeFundamental
\makeatother
```

Resulting in

The value is $1.602\,176\,634 \times 10^{-19}$ C

\k@cgs@short@ChargeFundamental `\k@cgs@short@ChargeFundamental` is the fundamental charge in cgs units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@short@ChargeFundamental
\makeatother
```

Resulting in

The value is 4.80×10^{-10} esu

\k@cgs@full@ChargeFundamental `\k@cgs@full@ChargeFundamental` is the fundamental charge in cgs units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@full@ChargeFundamental
\makeatother
```

Resulting in

The value is $4.803\,204\,713 \times 10^{-10}$ esu

\k@SI@short@ChargeFundamentalNumeric `\k@SI@short@ChargeFundamentalNumeric` is a mathematical value of the fundamental charge in SI units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@short@ChargeFundamentalNumeric
\makeatother
```

Resulting in

The value is $1.60e - 19$

\k@SI@full@ChargeFundamentalNumeric `\k@SI@full@ChargeFundamentalNumeric` is a mathematical value of the fundamental charge in SI units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@full@ChargeFundamentalNumeric
\makeatother
```

Resulting in

The value is $1.602176634e-19$

\k@cgs@short@ChargeFundamentalNumeric `\k@cgs@short@ChargeFundamentalNumeric` is a mathematical value of the fundamental charge in cgs units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@short@ChargeFundamentalNumeric
\makeatother
```

Resulting in

The value is $4.80e-10$

\k@cgs@full@ChargeFundamentalNumeric `\k@cgs@full@ChargeFundamentalNumeric` is a mathematical value of the fundamental charge in cgs units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@full@ChargeFundamentalNumeric
\makeatother
```

Resulting in

The value is $4.803204713e-10$

\k@SI@short@ChargeElectron `\k@SI@short@ChargeElectron` is the charge of an electron in SI units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@short@ChargeElectron
\makeatother
```

Resulting in

The value is $-1.60 \times 10^{-19}\,\mathrm{C}$

`\k@SI@full@ChargeElectron` `\k@SI@full@ChargeElectron` is the charge of an electron in SI units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@full@ChargeElectron
\makeatother
```

Resulting in

The value is $-1.602\,176\,634 \times 10^{-19}\,\mathrm{C}$

`\k@cgs@short@ChargeElectron` `\k@cgs@short@ChargeElectron` is the charge of an electron in cgs units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@short@ChargeElectron
\makeatother
```

Resulting in

The value is $-4.80 \times 10^{-10}\,\mathrm{esu}$

`\k@cgs@full@ChargeElectron` `\k@cgs@full@ChargeElectron` is the charge of an electron in cgs units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@full@ChargeElectron
\makeatother
```

Resulting in

The value is $-4.803\,204\,713 \times 10^{-10}\,\mathrm{esu}$

`\k@SI@short@ChargeElectronNumeric` `\k@SI@short@ChargeElectronNumeric` is a mathematical value of the charge of an electron in SI units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@short@ChargeElectronNumeric
\makeatother
```

Resulting in

The value is $-1.60e-19$

\k@SI@full@ChargeElectronNumeric

`\k@SI@full@ChargeElectronNumeric` is a mathematical value of the charge of an electron in SI units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@full@ChargeElectronNumeric
\makeatother
```

Resulting in

The value is $-1.602176634e-19$

\k@cgs@short@ChargeElectronNumeric

`\k@cgs@short@ChargeElectronNumeric` is a mathematical value of the charge of an electron in cgs units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@short@ChargeElectronNumeric
\makeatother
```

Resulting in

The value is $-4.80e-10$

\k@cgs@full@ChargeElectronNumeric

`\k@cgs@full@ChargeElectronNumeric` is a mathematical value of the charge of an electron in cgs units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@full@ChargeElectronNumeric
\makeatother
```

Resulting in

The value is $-4.803204713e-10$

`\k@SI@short@ChargeProton` `\k@SI@short@ChargeProton` is the charge of a proton in SI units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@short@ChargeProton
\makeatother
```

Resulting in

The value is $1.60 \times 10^{-19}\,\mathrm{C}$

`\k@SI@full@ChargeProton` `\k@SI@full@ChargeProton` is the charge of a proton in SI units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@full@ChargeProton
\makeatother
```

Resulting in

The value is $1.602\,176\,634 \times 10^{-19}\,\mathrm{C}$

`\k@cgs@short@ChargeProton` `\k@cgs@short@ChargeProton` is the charge of a proton in cgs units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@short@ChargeProton
\makeatother
```

Resulting in

The value is $4.80 \times 10^{-10}\,\mathrm{esu}$

`\k@cgs@full@ChargeProton` `\k@cgs@full@ChargeProton` is the charge of a proton in cgs units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@full@ChargeProton
\makeatother
```

Resulting in

The value is $4.803\,204\,713 \times 10^{-10}$ esu

`\k@SI@short@ChargeProtonNumeric` `\k@SI@short@ChargeProtonNumeric` is a mathematical value of the charge of a proton in SI units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@short@ChargeProtonNumeric
\makeatother
```

Resulting in

The value is $1.60e-19$

`\k@SI@full@ChargeProtonNumeric` `\k@SI@full@ChargeProtonNumeric` is a mathematical value of the charge of a proton in SI units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@full@ChargeProtonNumeric
\makeatother
```

Resulting in

The value is $1.602176634e-19$

`\k@cgs@short@ChargeProtonNumeric` `\k@cgs@short@ChargeProtonNumeric` is a mathematical value of the charge of a proton in cgs units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@short@ChargeProtonNumeric
\makeatother
```

Resulting in

The value is $4.80e-10$

\k@cgs@full@ChargeProtonNumeric

`\k@cgs@full@ChargeProtonNumeric` is a mathematical value of the charge of a proton in cgs units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@full@ChargeProtonNumeric
\makeatother
```

Resulting in

The value is $4.803204713e-10$

5.2.4 Distances and Lengths

\k@SI@short@RadiusBohr

`\k@SI@short@RadiusBohr` is Bohr radius of an atom in SI units with reduced precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@short@RadiusBohr
\makeatother
```

Resulting in

The value is $5.29 \times 10^{-11}\,\mathrm{m}$

\k@SI@full@RadiusBohr

`\k@SI@full@RadiusBohr` is Bohr radius of an atom in SI units with full precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@full@RadiusBohr
\makeatother
```

Resulting in

The value is $5.291\,772\,11 \times 10^{-11}\,\mathrm{m}$

`\k@cgs@short@RadiusBohr` `\k@cgs@short@RadiusBohr` is Bohr radius of an atom in cgs units with reduced precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@short@RadiusBohr
\makeatother
```

Resulting in

The value is $5.29 \times 10^{-9}\,\mathrm{cm}$

`\k@cgs@full@RadiusBohr` `\k@cgs@full@RadiusBohr` is Bohr radius of an atom in cgs units with full precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@full@RadiusBohr
\makeatother
```

Resulting in

The value is $5.291\,772\,11 \times 10^{-9}\,\mathrm{cm}$

`\k@SI@short@RadiusBohrNumeric` `\k@SI@short@RadiusBohrNumeric` is a mathematical value of Bohr radius of an atom in SI units with reduced precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@short@RadiusBohrNumeric
\makeatother
```

Resulting in

The value is $5.29e-11$

`\k@SI@full@RadiusBohrNumeric` `\k@SI@full@RadiusBohrNumeric` is a mathematical value of Bohr radius of an atom in SI units with full precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@full@RadiusBohrNumeric
\makeatother
```

Resulting in

The value is $5.29177211e-11$

`\k@cgs@short@RadiusBohrNumeric` `\k@cgs@short@RadiusBohrNumeric` is a mathematical value of Bohr radius of an atom in cgs units with reduced precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@short@RadiusBohrNumeric
\makeatother
```

Resulting in

The value is $5.29e-09$

`\k@cgs@full@RadiusBohrNumeric` `\k@cgs@full@RadiusBohrNumeric` is a mathematical value of Bohr radius of an atom in cgs units with full precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@full@RadiusBohrNumeric
\makeatother
```

Resulting in

The value is $5.29177211e-09$

`\k@SI@short@AstronomicalUnit` `\k@SI@short@AstronomicalUnit` is the astronomical unit (the average distance between the Earth and the Sun) in SI units with reduced precision. (IAU Resolution B2 2012)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@short@AstronomicalUnit
\makeatother
```

Resulting in

The value is $1.50 \times 10^{11}\,\mathrm{m}$

`\k@SI@full@AstronomicalUnit` `\k@SI@full@AstronomicalUnit` is the astronomical unit (the average distance between the Earth and the Sun) in SI units with full precision. (IAU Resolution B2 2012)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@full@AstronomicalUnit
\makeatother
```

Resulting in

The value is $1.495\,978\,707 \times 10^{11}\,\mathrm{m}$

`\k@cgs@short@AstronomicalUnit` `\k@cgs@short@AstronomicalUnit` is the astronomical unit (the average distance between the Earth and the Sun) in cgs units with reduced precision. (IAU Resolution B2 2012)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@short@AstronomicalUnit
\makeatother
```

Resulting in

The value is $1.50 \times 10^{13}\,\mathrm{cm}$

`\k@cgs@full@AstronomicalUnit` `\k@cgs@full@AstronomicalUnit` is the astronomical unit (the average distance between the Earth and the Sun) in cgs units with full precision. (IAU Resolution B2 2012)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@full@AstronomicalUnit
\makeatother
```

Resulting in

The value is $1.495\,978\,707 \times 10^{13}$ cm

\k@SI@short@AstronomicalUnitNumeric

`\k@SI@short@AstronomicalUnitNumeric` is a mathematical value of the astronomical unit (the average distance between the Earth and the Sun) in SI units with reduced precision. (IAU Resolution B2 2012)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@short@AstronomicalUnitNumeric
\makeatother
```

Resulting in

The value is $1.50e+11$

\k@SI@full@AstronomicalUnitNumeric

`\k@SI@full@AstronomicalUnitNumeric` is a mathematical value of the astronomical unit (the average distance between the Earth and the Sun) in SI units with full precision. (IAU Resolution B2 2012)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@full@AstronomicalUnitNumeric
\makeatother
```

Resulting in

The value is $1.495978707e+11$

\k@cgs@short@AstronomicalUnitNumeric

`\k@cgs@short@AstronomicalUnitNumeric` is a mathematical value of the astronomical unit (the average distance between the Earth and the Sun) in cgs units with reduced precision. (IAU Resolution B2 2012)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@short@AstronomicalUnitNumeric
\makeatother
```

Resulting in

The value is $1.50e+13$

\k@cgs@full@AstronomicalUnitNumeric `\k@cgs@full@AstronomicalUnitNumeric` is a mathematical value of the astronomical unit (the average distance between the Earth and the Sun) in cgs units with full precision. (IAU Resolution B2 2012)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@full@AstronomicalUnitNumeric
\makeatother
```

Resulting in

The value is $1.495978707e+13$

\k@SI@short@Parsec `\k@SI@short@Parsec` is the length of a parsec ($\frac{648000\,\mathrm{au}}{\pi}$) in SI units with reduced precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@short@Parsec
\makeatother
```

Resulting in

The value is $3.09 \times 10^{16}\,\mathrm{m}$

\k@SI@full@Parsec `\k@SI@full@Parsec` is the length of a parsec ($\frac{648000\,\mathrm{au}}{\pi}$) in SI units with full precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@full@Parsec
\makeatother
```

Resulting in

The value is $3.085\,677\,581 \times 10^{16}\,\mathrm{m}$

\k@cgs@short@Parsec `\k@cgs@short@Parsec` is the length of a parsec ($\frac{648000\,\mathrm{au}}{\pi}$) in cgs units with reduced precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@short@Parsec
\makeatother
```

Resulting in

The value is $3.09 \times 10^{18}\,\mathrm{cm}$

`\k@cgs@full@Parsec` `\k@cgs@full@Parsec` is the length of a parsec ($\frac{648000\,\mathrm{au}}{\pi}$) in cgs units with full precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@full@Parsec
\makeatother
```

Resulting in

The value is $3.085\,677\,581 \times 10^{18}\,\mathrm{cm}$

`\k@SI@short@ParsecNumeric` `\k@SI@short@ParsecNumeric` is a mathematical value of the length of a parsec ($\frac{648000\,\mathrm{au}}{\pi}$) in SI units with reduced precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@short@ParsecNumeric
\makeatother
```

Resulting in

The value is $3.09e+16$

`\k@SI@full@ParsecNumeric` `\k@SI@full@ParsecNumeric` is a mathematical value of the length of a parsec ($\frac{648000\,\mathrm{au}}{\pi}$) in SI units with full precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@full@ParsecNumeric
\makeatother
```

Resulting in

The value is $3.085677581e+16$

`\k@cgs@short@ParsecNumeric` `\k@cgs@short@ParsecNumeric` is a mathematical value of the length of a parsec ($\frac{648000\,\mathrm{au}}{\pi}$) in cgs units with reduced precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@short@ParsecNumeric
\makeatother
```

Resulting in

The value is $3.09e+18$

`\k@cgs@full@ParsecNumeric` `\k@cgs@full@ParsecNumeric` is a mathematical value of the length of a parsec ($\frac{648000\,\mathrm{au}}{\pi}$) in cgs units with full precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@full@ParsecNumeric
\makeatother
```

Resulting in

The value is $3.085677581e+18$

`\k@SI@short@RadiusSun` `\k@SI@short@RadiusSun` is the mean radius of the Sun in SI units with reduced precision. (IAU Resolution B3 2015)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@short@RadiusSun
\makeatother
```

Resulting in

The value is $6.96 \times 10^{8}\,\mathrm{m}$

`\k@SI@full@RadiusSun` `\k@SI@full@RadiusSun` is the mean radius of the Sun in SI units with full precision. (IAU Resolution B3 2015)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@full@RadiusSun
\makeatother
```

Resulting in

The value is 6.957×10^{8} m

`\k@cgs@short@RadiusSun` `\k@cgs@short@RadiusSun` is the mean radius of the Sun in cgs units with reduced precision. (IAU Resolution B3 2015)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@short@RadiusSun
\makeatother
```

Resulting in

The value is 6.96×10^{10} cm

`\k@cgs@full@RadiusSun` `\k@cgs@full@RadiusSun` is the mean radius of the Sun in cgs units with full precision. (IAU Resolution B3 2015)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@full@RadiusSun
\makeatother
```

Resulting in

The value is 6.957×10^{10} cm

`\k@SI@short@RadiusSunNumeric` `\k@SI@short@RadiusSunNumeric` is a mathematical value of the mean radius of the Sun in SI units with reduced precision. (IAU Resolution B3 2015)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@short@RadiusSunNumeric
\makeatother
```

Resulting in

The value is $6.96e+08$

`\k@SI@full@RadiusSunNumeric` `\k@SI@full@RadiusSunNumeric` is a mathematical value of the mean radius of the Sun in SI units with full precision. (IAU Resolution B3 2015)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@full@RadiusSunNumeric
\makeatother
```

Resulting in

The value is $6.957e+08$

`\k@cgs@short@RadiusSunNumeric` `\k@cgs@short@RadiusSunNumeric` is a mathematical value of the mean radius of the Sun in cgs units with reduced precision. (IAU Resolution B3 2015)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@short@RadiusSunNumeric
\makeatother
```

Resulting in

The value is $6.96e+10$

`\k@cgs@full@RadiusSunNumeric` `\k@cgs@full@RadiusSunNumeric` is a mathematical value of the mean radius of the Sun in cgs units with full precision. (IAU Resolution B3 2015)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@full@RadiusSunNumeric
\makeatother
```

Resulting in

The value is $6.957e+10$

`\k@short@RadiusEarth` `\k@short@RadiusEarth` is the mean radius of the Earth with reduced precision. (IAU Resolution B3 2015)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@short@RadiusEarth
\makeatother
```

Resulting in

The value is 6.37×10^6 m

`\k@full@RadiusEarth` `\k@full@RadiusEarth` is the mean radius of the Earth with full precision. (IAU Resolution B3 2015)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@full@RadiusEarth
\makeatother
```

Resulting in

The value is $6.371\,0 \times 10^6$ m

`\k@short@RadiusEarthNumeric` `\k@short@RadiusEarthNumeric` is a mathematical value of the mean radius of the Earth with reduced precision. (IAU Resolution B3 2015)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@short@RadiusEarthNumeric
\makeatother
```

Resulting in

The value is $6.37e+06$

`\k@full@RadiusEarthNumeric` `\k@full@RadiusEarthNumeric` is a mathematical value of the mean radius of the Earth with full precision. (IAU Resolution B3 2015)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@full@RadiusEarthNumeric
\makeatother
```

Resulting in

The value is $6.3710e+06$

`\k@short@RadiusJupiter` `\k@short@RadiusJupiter` is the mean radius of Jupiter with reduced precision. (IAU Resolution B3 2015)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@short@RadiusJupiter
\makeatother
```

Resulting in

The value is $6.99 \times 10^{7}\,\mathrm{m}$

`\k@full@RadiusJupiter` `\k@full@RadiusJupiter` is the mean radius of Jupiter with full precision. (IAU Resolution B3 2015)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@full@RadiusJupiter
\makeatother
```

Resulting in

The value is $6.991\,1 \times 10^{7}\,\mathrm{m}$

`\k@short@RadiusJupiterNumeric` `\k@short@RadiusJupiterNumeric` is a mathematical value of the mean radius of Jupiter with reduced precision. (IAU Resolution B3 2015)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@short@RadiusJupiterNumeric
\makeatother
```

Resulting in

The value is $6.99e+07$

`\k@full@RadiusJupiterNumeric` `\k@full@RadiusJupiterNumeric` is a mathematical value of the mean radius of Jupiter with full precision. (IAU Resolution B3 2015)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@full@RadiusJupiterNumeric
\makeatother
```

Resulting in

The value is $6.9911e+07$

5.2.5 Energy, Power, and Luminosity

`\k@SI@short@Rydberg` `\k@SI@short@Rydberg` is the Rydberg energy (the binding energy of Hydrogen) in SI units with reduced precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@short@Rydberg
\makeatother
```

Resulting in

The value is $2.18 \times 10^{-18}\,\mathrm{J}$

`\k@SI@full@Rydberg` `\k@SI@full@Rydberg` is the Rydberg energy (the binding energy of Hydrogen) in SI units with full precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@full@Rydberg
\makeatother
```

Resulting in

The value is $2.179\,872\,36 \times 10^{-18}\,\mathrm{J}$

`\k@cgs@short@Rydberg` `\k@cgs@short@Rydberg` is the Rydberg energy (the binding energy of Hydrogen) in cgs units with reduced precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@short@Rydberg
\makeatother
```

Resulting in

The value is 2.18×10^{-11} erg

`\k@cgs@full@Rydberg` `\k@cgs@full@Rydberg` is the Rydberg energy (the binding energy of Hydrogen) in cgs units with full precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@full@Rydberg
\makeatother
```

Resulting in

The value is $2.179\,872\,36 \times 10^{-11}$ erg

`\k@eV@short@Rydberg` `\k@eV@short@Rydberg` is the Rydberg energy (the binding energy of Hydrogen) in eV with reduced precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@eV@short@Rydberg
\makeatother
```

Resulting in

The value is 1.36×10^{1} eV

`\k@eV@full@Rydberg` `\k@eV@full@Rydberg` is the Rydberg energy (the binding energy of Hydrogen) in eV with full precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@eV@full@Rydberg
\makeatother
```

Resulting in

The value is $1.360\,569\,31 \times 10^{1}$ eV

`\k@SI@short@RydbergNumeric` `\k@SI@short@RydbergNumeric` is a mathematical value of the Rydberg energy (the binding energy of Hydrogen) in SI units with reduced precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@short@RydbergNumeric
\makeatother
```

Resulting in

The value is $2.18e-18$

`\k@SI@full@RydbergNumeric` `\k@SI@full@RydbergNumeric` is a mathematical value of the Rydberg energy (the binding energy of Hydrogen) in SI units with full precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@full@RydbergNumeric
\makeatother
```

Resulting in

The value is $2.17987236e-18$

`\k@cgs@short@RydbergNumeric` `\k@cgs@short@RydbergNumeric` is a mathematical value of the Rydberg energy (the binding energy of Hydrogen) in cgs units with reduced precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@short@RydbergNumeric
\makeatother
```

Resulting in

The value is $2.18e-11$

`\k@cgs@full@RydbergNumeric` `\k@cgs@full@RydbergNumeric` is a mathematical value of the Rydberg energy (the binding energy of Hydrogen) in cgs units with full precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@full@RydbergNumeric
\makeatother
```

Resulting in

The value is $2.17987236e-11$

`\k@eV@short@RydbergNumeric` `\k@eV@short@RydbergNumeric` is a mathematical value of the Rydberg energy (the binding energy of Hydrogen) in eV with reduced precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@eV@short@RydbergNumeric
\makeatother
```

Resulting in

The value is $1.36e+01$

`\k@eV@full@RydbergNumeric` `\k@eV@full@RydbergNumeric` is a mathematical value of the Rydberg energy (the binding energy of Hydrogen) in eV with full precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@eV@full@RydbergNumeric
\makeatother
```

Resulting in

The value is $1.36056931e+01$

`\k@SI@short@LuminositySun` `\k@SI@short@LuminositySun` is the luminosity of the Sun in SI units with reduced precision. (IAU Resolution B3 2015)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@short@LuminositySun
\makeatother
```

Resulting in

The value is $3.83 \times 10^{26}\,\mathrm{W}$

`\k@SI@full@LuminositySun` `\k@SI@full@LuminositySun` is the luminosity of the Sun in SI units with full precision. (IAU Resolution B3 2015)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@full@LuminositySun
\makeatother
```

Resulting in

The value is $3.828 \times 10^{26}\,\mathrm{W}$

`\k@cgs@short@LuminositySun` `\k@cgs@short@LuminositySun` is the luminosity of the Sun in cgs units with reduced precision. (IAU Resolution B3 2015)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@short@LuminositySun
\makeatother
```

Resulting in

The value is $3.83 \times 10^{33}\,\mathrm{erg\,s^{-1}}$

`\k@cgs@full@LuminositySun` `\k@cgs@full@LuminositySun` is the luminosity of the Sun in cgs units with full precision. (IAU Resolution B3 2015)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@full@LuminositySun
\makeatother
```

Resulting in

The value is $3.828 \times 10^{33}\,\mathrm{erg\,s^{-1}}$

`\k@SI@short@LuminositySunNumeric` `\k@SI@short@LuminositySunNumeric` is a mathematical value of the luminosity of the Sun in SI units with reduced precision. (IAU Resolution B3 2015)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@short@LuminositySunNumeric
\makeatother
```

Resulting in

The value is $3.83e+26$

`\k@SI@full@LuminositySunNumeric` `\k@SI@full@LuminositySunNumeric` is a mathematical value of the luminosity of the Sun in SI units with full precision. (IAU Resolution B3 2015)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@full@LuminositySunNumeric
\makeatother
```

Resulting in

The value is $3.828e+26$

`\k@cgs@short@LuminositySunNumeric` `\k@cgs@short@LuminositySunNumeric` is a mathematical value of the luminosity of the Sun in cgs units with reduced precision. (IAU Resolution B3 2015)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@short@LuminositySunNumeric
\makeatother
```

Resulting in

The value is $3.83e+33$

`\k@cgs@full@LuminositySunNumeric` `\k@cgs@full@LuminositySunNumeric` is a mathematical value of the luminosity of the Sun in cgs units with full precision. (IAU Resolution B3 2015)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@full@LuminositySunNumeric
\makeatother
```

Resulting in

The value is $3.828e+33$

5.2.6 Pressure

\k@SI@short@PressureAtmosphere `\k@SI@short@PressureAtmosphere` is the standard atmospheric pressure in SI units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@short@PressureAtmosphere
\makeatother
```

Resulting in

The value is $1.01 \times 10^{5}\,\mathrm{Pa}$

\k@SI@full@PressureAtmosphere `\k@SI@full@PressureAtmosphere` is the standard atmospheric pressure in SI units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@full@PressureAtmosphere
\makeatother
```

Resulting in

The value is $1.013\,25 \times 10^{5}\,\mathrm{Pa}$

\k@cgs@short@PressureAtmosphere `\k@cgs@short@PressureAtmosphere` is the standard atmospheric pressure in cgs units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@short@PressureAtmosphere
\makeatother
```

Resulting in

The value is 1.01 bar

\k@cgs@full@PressureAtmosphere\k@cgs@full@PressureAtmosphere is the standard atmospheric pressure in cgs units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@full@PressureAtmosphere
\makeatother
```

Resulting in

The value is 1.013 25 bar

\k@SI@short@PressureAtmosphere\k@SI@short@PressureAtmosphereNumeric is a mathematical value of the standard atmospheric pressure in SI units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@short@PressureAtmosphereNumeric
\makeatother
```

Resulting in

The value is $1.01e+05$

\k@SI@full@PressureAtmosphere\k@SI@full@PressureAtmosphereNumeric is a mathematical value of the standard atmospheric pressure in SI units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@full@PressureAtmosphereNumeric
\makeatother
```

Resulting in

The value is $1.01325e+05$

\k@cgs@short@PressureAtmosphere\k@cgs@short@PressureAtmosphereNumeric is a mathematical value of the standard atmospheric pressure in cgs units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@short@PressureAtmosphereNumeric
\makeatother
```

Resulting in

The value is $1.01e+00$

\k@cgs@full@PressureAtmosphereNumeric `\k@cgs@full@PressureAtmosphereNumeric` is a mathematical value of the standard atmospheric pressure in cgs units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@full@PressureAtmosphereNumeric
\makeatother
```

Resulting in

The value is $1.01325e+00$

\k@SI@short@PressureStandard `\k@SI@short@PressureStandard` is the standard atmospheric pressure in SI units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@short@PressureStandard
\makeatother
```

Resulting in

The value is $1.00 \times 10^{5}\,\mathrm{Pa}$

\k@SI@full@PressureStandard `\k@SI@full@PressureStandard` is the standard atmospheric pressure in SI units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@full@PressureStandard
\makeatother
```

Resulting in

The value is $1.000\,00 \times 10^{5}\,\mathrm{Pa}$

\k@cgs@short@PressureStandard `\k@cgs@short@PressureStandard` is the standard atmospheric pressure in cgs units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@short@PressureStandard
\makeatother
```

Resulting in

The value is 1.00 bar

\k@cgs@full@PressureStandard `\k@cgs@full@PressureStandard` is the standard atmospheric pressure in cgs units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@full@PressureStandard
\makeatother
```

Resulting in

The value is 1.000 00 bar

\k@SI@short@PressureStandardNumeric `\k@SI@short@PressureStandardNumeric` is a mathematical value of the standard atmospheric pressure in SI units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@short@PressureStandardNumeric
\makeatother
```

Resulting in

The value is $1.00e+05$

\k@SI@full@PressureStandardNumeric `\k@SI@full@PressureStandardNumeric` is a mathematical value of the standard atmospheric pressure in SI units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@full@PressureStandardNumeric
\makeatother
```

Resulting in

The value is $1.00000e+05$

\k@cgs@short@PressureStandardNumeric

\k@cgs@short@PressureStandardNumeric is a mathematical value of the standard atmospheric pressure in cgs units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@short@PressureStandardNumeric
\makeatother
```

Resulting in

The value is $1.00e+00$

\k@cgs@full@PressureStandardNumeric

\k@cgs@full@PressureStandardNumeric is a mathematical value of the standard atmospheric pressure in cgs units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@full@PressureStandardNumeric
\makeatother
```

Resulting in

The value is $1.00000e+00$

5.2.7 Velocity, Speed and Acceleration

\k@SI@short@SpeedLight

\k@SI@short@SpeedLight is the speed of light in SI units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@short@SpeedLight
\makeatother
```

Resulting in

The value is $3.00 \times 10^{8}\,\mathrm{m\,s^{-1}}$

`\k@SI@full@SpeedLight` `\k@SI@full@SpeedLight` is the speed of light in SI units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@full@SpeedLight
\makeatother
```

Resulting in

The value is $2.997\,924\,58 \times 10^{8}\,\mathrm{m\,s^{-1}}$

`\k@cgs@short@SpeedLight` `\k@cgs@short@SpeedLight` is the speed of light in cgs units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@short@SpeedLight
\makeatother
```

Resulting in

The value is $3.00 \times 10^{10}\,\mathrm{cm\,s^{-1}}$

`\k@cgs@full@SpeedLight` `\k@cgs@full@SpeedLight` is the speed of light in cgs units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@full@SpeedLight
\makeatother
```

Resulting in

The value is $2.997\,924\,58 \times 10^{10}\,\mathrm{cm\,s^{-1}}$

`\k@SI@short@SpeedLightNumeric` `\k@SI@short@SpeedLightNumeric` is a mathematical value of the speed of light in SI units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@short@SpeedLightNumeric
\makeatother
```

Resulting in

The value is $3.00e+08$

`\k@SI@full@SpeedLightNumeric` `\k@SI@full@SpeedLightNumeric` is a mathematical value of the speed of light in SI units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@full@SpeedLightNumeric
\makeatother
```

Resulting in

The value is $2.99792458e+08$

`\k@cgs@short@SpeedLightNumeric` `\k@cgs@short@SpeedLightNumeric` is a mathematical value of the speed of light in cgs units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@short@SpeedLightNumeric
\makeatother
```

Resulting in

The value is $3.00e+10$

`\k@cgs@full@SpeedLightNumeric` `\k@cgs@full@SpeedLightNumeric` is a mathematical value of the speed of light in cgs units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@full@SpeedLightNumeric
\makeatother
```

Resulting in

The value is $2.99792458e+10$

`\k@SI@short@AccelGravity` `\k@SI@short@AccelGravity` is the accelertion due to gravity at the surface of the Earth in SI units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@short@AccelGravity
\makeatother
```

Resulting in

The value is $9.81\,\mathrm{m\,s^{-2}}$

`\k@SI@full@AccelGravity` `\k@SI@full@AccelGravity` is the accelertion due to gravity at the surface of the Earth in SI units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@full@AccelGravity
\makeatother
```

Resulting in

The value is $9.806\,65\,\mathrm{m\,s^{-2}}$

`\k@cgs@short@AccelGravity` `\k@cgs@short@AccelGravity` is the accelertion due to gravity at the surface of the Earth in cgs units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@short@AccelGravity
\makeatother
```

Resulting in

The value is $9.81 \times 10^{2}\,\mathrm{cm\,s^{-2}}$

`\k@cgs@full@AccelGravity` `\k@cgs@full@AccelGravity` is the accelertion due to gravity at the surface of the Earth in cgs units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@full@AccelGravity
\makeatother
```

Resulting in

The value is $9.806\,65 \times 10^{2}\,\mathrm{cm\,s^{-2}}$

`\k@SI@short@AccelGravityNumeric` `\k@SI@short@AccelGravityNumeric` is a mathematical value of the accelertion due to gravity at the surface of the Earth in SI units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@short@AccelGravityNumeric
\makeatother
```

Resulting in

The value is $9.81e+00$

`\k@SI@full@AccelGravityNumeric` `\k@SI@full@AccelGravityNumeric` is a mathematical value of the accelertion due to gravity at the surface of the Earth in SI units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@full@AccelGravityNumeric
\makeatother
```

Resulting in

The value is $9.80665e+00$

\k@cgs@short@AccelGravityNumeric \k@cgs@short@AccelGravityNumeric is a mathematical value of the accelertion due to gravity at the surface of the Earth in cgs units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@short@AccelGravityNumeric
\makeatother
```

Resulting in

The value is $9.81e+02$

\k@cgs@full@AccelGravityNumeric \k@cgs@full@AccelGravityNumeric is a mathematical value of the accelertion due to gravity at the surface of the Earth in cgs units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@full@AccelGravityNumeric
\makeatother
```

Resulting in

The value is $9.80665e+02$

5.2.8 Other Constants

\k@SI@short@Coulomb \k@SI@short@Coulomb is the Coulomb constant ($\frac{1}{4\pi\epsilon_0}$) in SI units with reduced precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@short@Coulomb
\makeatother
```

Resulting in

The value is $8.99 \times 10^{9}\,\mathrm{N\,m^{2}\,C^{-2}}$

`\k@SI@full@Coulomb` `\k@SI@full@Coulomb` is the Coulomb constant ($\frac{1}{4\pi\epsilon_0}$) in SI units with full precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@full@Coulomb
\makeatother
```

Resulting in

The value is $8.987\,551\,79 \times 10^{9}\,\mathrm{N\,m^{2}\,C^{-2}}$

`\k@cgs@short@Coulomb` `\k@cgs@short@Coulomb` is the Coulomb constant ($\frac{1}{4\pi\epsilon_0}$) in cgs units with reduced precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@short@Coulomb
\makeatother
```

Resulting in

The value is 1.00

`\k@cgs@full@Coulomb` `\k@cgs@full@Coulomb` is the Coulomb constant ($\frac{1}{4\pi\epsilon_0}$) in cgs units with full precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@full@Coulomb
\makeatother
```

Resulting in

The value is 1.000 000 00

`\k@SI@short@CoulombNumeric` `\k@SI@short@CoulombNumeric` is a mathematical value of the Coulomb constant ($\frac{1}{4\pi\epsilon_0}$) in SI units with reduced precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@short@CoulombNumeric
\makeatother
```

Resulting in

The value is $8.99e+09$

`\k@SI@full@CoulombNumeric` `\k@SI@full@CoulombNumeric` is a mathematical value of the Coulomb constant ($\frac{1}{4\pi\epsilon_0}$) in SI units with full precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@full@CoulombNumeric
\makeatother
```

Resulting in

The value is $8.98755179e+09$

`\k@cgs@short@CoulombNumeric` `\k@cgs@short@CoulombNumeric` is a mathematical value of the Coulomb constant ($\frac{1}{4\pi\epsilon_0}$) in cgs units with reduced precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@short@CoulombNumeric
\makeatother
```

Resulting in

The value is $1.00e+00$

`\k@cgs@full@CoulombNumeric` `\k@cgs@full@CoulombNumeric` is a mathematical value of the Coulomb constant ($\frac{1}{4\pi\epsilon_0}$) in cgs units with full precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@full@CoulombNumeric
\makeatother
```

Resulting in

The value is $1.00000000e+00$

\k@SI@short@VacuumPermittivity `\k@SI@short@VacuumPermittivity` is the electric permittivity of the vacuum in SI units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@short@VacuumPermittivity
\makeatother
```

Resulting in

The value is $8.85 \times 10^{-12}\,\mathrm{F\,m^{-1}}$

\k@SI@full@VacuumPermittivity `\k@SI@full@VacuumPermittivity` is the electric permittivity of the vacuum in SI units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@full@VacuumPermittivity
\makeatother
```

Resulting in

The value is $8.854\,187\,812\,8 \times 10^{-12}\,\mathrm{F\,m^{-1}}$

\k@cgs@short@VacuumPermittivity `\k@cgs@short@VacuumPermittivity` is the electric permittivity of the vacuum in cgs units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@short@VacuumPermittivity
\makeatother
```

Resulting in

The value is 7.96×10^{-2}

\k@cgs@full@VacuumPermittivity `\k@cgs@full@VacuumPermittivity` is the electric permittivity of the vacuum in cgs units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@full@VacuumPermittivity
\makeatother
```

Resulting in

The value is $7.957\,747\,154\,6 \times 10^{-2}$

\k@SI@short@VacuumPermittivityNumeric \k@SI@short@VacuumPermittivityNumeric is a mathematical value of the electric permittivity of the vacuum in SI units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@short@VacuumPermittivityNumeric
\makeatother
```

Resulting in

The value is $8.85e-12$

\k@SI@full@VacuumPermittivityNumeric \k@SI@full@VacuumPermittivityNumeric is a mathematical value of the electric permittivity of the vacuum in SI units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@full@VacuumPermittivityNumeric
\makeatother
```

Resulting in

The value is $8.8541878128e-12$

\k@cgs@short@VacuumPermittivityNumeric \k@cgs@short@VacuumPermittivityNumeric is a mathematical value of the electric permittivity of the vacuum in cgs units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@short@VacuumPermittivityNumeric
\makeatother
```

Resulting in

The value is $7.96e-02$

\k@cgs@full@VacuumPermittivityNumeric `\k@cgs@full@VacuumPermittivityNumeric` is a mathematical value of the electric permittivity of the vacuum in cgs units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@full@VacuumPermittivityNumeric
\makeatother
```

Resulting in

The value is $7.9577471546e-02$

\k@SI@short@VacuumPermeability `\k@SI@short@VacuumPermeability` is the magnetic permeability of the vacuum in SI units with reduced precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@short@VacuumPermeability
\makeatother
```

Resulting in

The value is $1.26 \times 10^{-6}\,\mathrm{N\,A^{-2}}$

\k@SI@full@VacuumPermeability `\k@SI@full@VacuumPermeability` is the magnetic permeability of the vacuum in SI units with full precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@full@VacuumPermeability
\makeatother
```

Resulting in

The value is $1.256\,637\,062\,1 \times 10^{-6}\,\mathrm{N\,A^{-2}}$

\k@cgs@short@VacuumPermeability \k@cgs@short@VacuumPermeability is the magnetic permeability of the vacuum in cgs units with reduced precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@short@VacuumPermeability
\makeatother
```

Resulting in

The value is 1.26×10^{1}

\k@cgs@full@VacuumPermeability \k@cgs@full@VacuumPermeability is the magnetic permeability of the vacuum in cgs units with full precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@full@VacuumPermeability
\makeatother
```

Resulting in

The value is $1.256\,637\,061\,4 \times 10^{1}$

\k@SI@short@VacuumPermeabilityNumeric \k@SI@short@VacuumPermeabilityNumeric is a mathematical value of the magnetic permeability of the vacuum in SI units with reduced precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@short@VacuumPermeabilityNumeric
\makeatother
```

Resulting in

The value is $1.26e-06$

\k@SI@full@VacuumPermeabilityNumeric \k@SI@full@VacuumPermeabilityNumeric is a mathematical value of the magnetic permeability of the vacuum in SI units with full precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@full@VacuumPermeabilityNumeric
\makeatother
```

Resulting in

The value is $1.2566370621e-06$

\k@cgs@short@VacuumPermeabilityNumeric `\k@cgs@short@VacuumPermeabilityNumeric` is a mathematical value of the magnetic permeability of the vacuum in cgs units with reduced precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@short@VacuumPermeabilityNumeric
\makeatother
```

Resulting in

The value is $1.26e+01$

\k@cgs@full@VacuumPermeabilityNumeric `\k@cgs@full@VacuumPermeabilityNumeric` is a mathematical value of the magnetic permeability of the vacuum in cgs units with full precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@full@VacuumPermeabilityNumeric
\makeatother
```

Resulting in

The value is $1.2566370614e+01$

\k@short@VacuumImpedance `\k@short@VacuumImpedance` is the characteristic impedance of the vacuum with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@short@VacuumImpedance
\makeatother
```

Resulting in

The value is $3.77 \times 10^{2}\,\Omega$

`\k@full@VacuumImpedance` `\k@full@VacuumImpedance` is the characteristic impedance of the vacuum with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@full@VacuumImpedance
\makeatother
```

Resulting in

The value is $3.767\,303\,136\,68 \times 10^{2}\,\Omega$

`\k@short@VacuumImpedanceNumeric` `\k@short@VacuumImpedanceNumeric` is a mathematical value of the characteristic impedance of the vacuum with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@short@VacuumImpedanceNumeric
\makeatother
```

Resulting in

The value is $3.77e+02$

`\k@full@VacuumImpedanceNumeric` `\k@full@VacuumImpedanceNumeric` is a mathematical value of the characteristic impedance of the vacuum with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@full@VacuumImpedanceNumeric
\makeatother
```

Resulting in

The value is $3.76730313668e+02$

`\k@SI@short@Boltzmann` `\k@SI@short@Boltzmann` is the Boltzmann constant in SI units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@short@Boltzmann
\makeatother
```

Resulting in

The value is $1.38 \times 10^{-23}\,\mathrm{J\,K^{-1}}$

`\k@SI@full@Boltzmann` `\k@SI@full@Boltzmann` is the Boltzmann constant in SI units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@full@Boltzmann
\makeatother
```

Resulting in

The value is $1.380\,649 \times 10^{-23}\,\mathrm{J\,K^{-1}}$

`\k@cgs@short@Boltzmann` `\k@cgs@short@Boltzmann` is the Boltzmann constant in cgs units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@short@Boltzmann
\makeatother
```

Resulting in

The value is $1.38 \times 10^{-16}\,\mathrm{erg\,K^{-1}}$

`\k@cgs@full@Boltzmann` `\k@cgs@full@Boltzmann` is the Boltzmann constant in cgs units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@full@Boltzmann
\makeatother
```

Resulting in

The value is $1.380\,649 \times 10^{-16}\,\mathrm{erg\,K^{-1}}$

`\k@eV@short@Boltzmann` `\k@eV@short@Boltzmann` is the Boltzmann constant in eV with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@eV@short@Boltzmann
\makeatother
```

Resulting in

The value is $8.62 \times 10^{-5}\,\mathrm{eV\,K^{-1}}$

`\k@eV@full@Boltzmann` `\k@eV@full@Boltzmann` is the Boltzmann constant in eV with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@eV@full@Boltzmann
\makeatother
```

Resulting in

The value is $8.617\,333 \times 10^{-5}\,\mathrm{eV\,K^{-1}}$

`\k@SI@short@BoltzmannNumeric` `\k@SI@short@BoltzmannNumeric` is a mathematical value of the Boltzmann constant in SI units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@short@BoltzmannNumeric
\makeatother
```

Resulting in

The value is $1.38e-23$

`\k@SI@full@BoltzmannNumeric` `\k@SI@full@BoltzmannNumeric` is a mathematical value of the Boltzmann constant in SI units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@full@BoltzmannNumeric
\makeatother
```

Resulting in

The value is $1.380649e-23$

`\k@cgs@short@BoltzmannNumeric` `\k@cgs@short@BoltzmannNumeric` is a mathematical value of the Boltzmann constant in cgs units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@short@BoltzmannNumeric
\makeatother
```

Resulting in

The value is $1.38e-16$

`\k@cgs@full@BoltzmannNumeric` `\k@cgs@full@BoltzmannNumeric` is a mathematical value of the Boltzmann constant in cgs units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@full@BoltzmannNumeric
\makeatother
```

Resulting in

The value is $1.380649e-16$

`\k@eV@short@BoltzmannNumeric` `\k@eV@short@BoltzmannNumeric` is a mathematical value of the Boltzmann constant in eV with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@eV@short@BoltzmannNumeric
\makeatother
```

Resulting in

The value is $8.62e-05$

`\k@eV@full@BoltzmannNumeric` `\k@eV@full@BoltzmannNumeric` is a mathematical value of the Boltzmann constant in eV with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@eV@full@BoltzmannNumeric
\makeatother
```

Resulting in

The value is $8.617333e-05$

`\k@SI@short@Planck` `\k@SI@short@Planck` is the Planck constant in SI units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@short@Planck
\makeatother
```

Resulting in

The value is $6.63 \times 10^{-34}\,\mathrm{J\,s}$

`\k@SI@full@Planck` `\k@SI@full@Planck` is the Planck constant in SI units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@full@Planck
\makeatother
```

Resulting in

The value is $6.626\,070\,15 \times 10^{-34}\,\mathrm{J\,s}$

`\k@cgs@short@Planck` `\k@cgs@short@Planck` is the Planck constant in cgs units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@short@Planck
\makeatother
```

Resulting in

The value is $6.63 \times 10^{-27}\,\mathrm{erg\,s}$

`\k@cgs@full@Planck` `\k@cgs@full@Planck` is the Planck constant in cgs units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@full@Planck
\makeatother
```

Resulting in

The value is $6.626\,070\,15 \times 10^{-27}\,\mathrm{erg\,s}$

`\k@eV@short@Planck` `\k@eV@short@Planck` is the Planck constant in eV with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@eV@short@Planck
\makeatother
```

Resulting in

The value is $4.14 \times 10^{-15}\,\mathrm{eV\,s}$

`\k@eV@full@Planck` `\k@eV@full@Planck` is the Planck constant in eV with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@eV@full@Planck
\makeatother
```

Resulting in

The value is $4.135\,667\,70 \times 10^{-15}\,\mathrm{eV\,s}$

`\k@SI@short@PlanckNumeric` `\k@SI@short@PlanckNumeric` is a mathematical value of the Planck constant in SI units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@short@PlanckNumeric
\makeatother
```

Resulting in

The value is $6.63e-34$

`\k@SI@full@PlanckNumeric` `\k@SI@full@PlanckNumeric` is a mathematical value of the Planck constant in SI units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@full@PlanckNumeric
\makeatother
```

Resulting in

The value is $6.62607015e-34$

`\k@cgs@short@PlanckNumeric` `\k@cgs@short@PlanckNumeric` is a mathematical value of the Planck constant in cgs units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@short@PlanckNumeric
\makeatother
```

Resulting in

The value is $6.63e-27$

`\k@cgs@full@PlanckNumeric` `\k@cgs@full@PlanckNumeric` is a mathematical value of the Planck constant in cgs units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@full@PlanckNumeric
\makeatother
```

Resulting in

The value is $6.62607015e-27$

`\k@eV@short@PlanckNumeric` `\k@eV@short@PlanckNumeric` is a mathematical value of the Planck constant in eV with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@eV@short@PlanckNumeric
\makeatother
```

Resulting in

The value is $4.14e-15$

`\k@eV@full@PlanckNumeric` `\k@eV@full@PlanckNumeric` is a mathematical value of the Planck constant in eV with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@eV@full@PlanckNumeric
\makeatother
```

Resulting in

The value is $4.13566770e-15$

`\k@SI@short@PlanckReduced` `\k@SI@short@PlanckReduced` is the Reduced Planck constant $\left(\frac{h}{2\pi}\right)$ in SI units with reduced precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@short@PlanckReduced
\makeatother
```

Resulting in

The value is $1.05 \times 10^{-34}\,\mathrm{J\,s}$

`\k@SI@full@PlanckReduced` `\k@SI@full@PlanckReduced` is the Reduced Planck constant $\left(\frac{h}{2\pi}\right)$ in SI units with full precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@full@PlanckReduced
\makeatother
```

Resulting in

The value is $1.054\,571\,82 \times 10^{-34}\,\mathrm{J\,s}$

`\k@cgs@short@PlanckReduced` `\k@cgs@short@PlanckReduced` is the Reduced Planck constant $\left(\frac{h}{2\pi}\right)$ in cgs units with reduced precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@short@PlanckReduced
\makeatother
```

Resulting in

The value is $1.05 \times 10^{-27}\,\mathrm{erg\,s}$

`\k@cgs@full@PlanckReduced` `\k@cgs@full@PlanckReduced` is the Reduced Planck constant $\left(\frac{h}{2\pi}\right)$ in cgs units with full precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@full@PlanckReduced
\makeatother
```

Resulting in

The value is $1.054\,571\,82 \times 10^{-27}\,\mathrm{erg\,s}$

`\k@eV@short@PlanckReduced` `\k@eV@short@PlanckReduced` is the Reduced Planck constant $\left(\frac{h}{2\pi}\right)$ in eV with reduced precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@eV@short@PlanckReduced
\makeatother
```

Resulting in

The value is $6.58 \times 10^{-16}\,\mathrm{eV\,s}$

`\k@eV@full@PlanckReduced` `\k@eV@full@PlanckReduced` is the Reduced Planck constant $\left(\frac{h}{2\pi}\right)$ in eV with full precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@eV@full@PlanckReduced
\makeatother
```

Resulting in

The value is $6.582\,119\,57 \times 10^{-16}\,\mathrm{eV\,s}$

`\k@SI@short@PlanckReducedNumeri` `\k@SI@short@PlanckReducedNumeric` is a mathematical value of the Reduced Planck constant $\left(\frac{h}{2\pi}\right)$ in SI units with reduced precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@short@PlanckReducedNumeric
\makeatother
```

Resulting in

The value is $1.05e-34$

`\k@SI@full@PlanckReducedNumeri` `\k@SI@full@PlanckReducedNumeric` is a mathematical value of the Reduced Planck constant $\left(\frac{h}{2\pi}\right)$ in SI units with full precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@full@PlanckReducedNumeric
\makeatother
```

Resulting in

The value is $1.05457182e-34$

\k@cgs@short@PlanckReducedNumeric `\k@cgs@short@PlanckReducedNumeric` is a mathematical value of the Reduced Planck constant $\left(\frac{h}{2\pi}\right)$ in cgs units with reduced precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@short@PlanckReducedNumeric
\makeatother
```

Resulting in

The value is $1.05e-27$

\k@cgs@full@PlanckReducedNumeric `\k@cgs@full@PlanckReducedNumeric` is a mathematical value of the Reduced Planck constant $\left(\frac{h}{2\pi}\right)$ in cgs units with full precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@full@PlanckReducedNumeric
\makeatother
```

Resulting in

The value is $1.05457182e-27$

\k@eV@short@PlanckReducedNumeric `\k@eV@short@PlanckReducedNumeric` is a mathematical value of the Reduced Planck constant $\left(\frac{h}{2\pi}\right)$ in eV with reduced precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@eV@short@PlanckReducedNumeric
\makeatother
```

Resulting in

The value is $6.58e-16$

\k@eV@full@PlanckReducedNumeric `\k@eV@full@PlanckReducedNumeric` is a mathematical value of the Reduced Planck constant $\left(\frac{h}{2\pi}\right)$ in eV with full precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@eV@full@PlanckReducedNumeric
\makeatother
```

Resulting in

The value is $6.58211957e-16$

`\k@SI@short@Gravity` `\k@SI@short@Gravity` is Newton's gravitational constant in SI units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@short@Gravity
\makeatother
```

Resulting in

The value is $6.67 \times 10^{-11}\,\mathrm{N\,kg^{-2}\,m^{2}}$

`\k@SI@full@Gravity` `\k@SI@full@Gravity` is Newton's gravitational constant in SI units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@full@Gravity
\makeatother
```

Resulting in

The value is $6.674\,30 \times 10^{-11}\,\mathrm{N\,kg^{-2}\,m^{2}}$

`\k@cgs@short@Gravity` `\k@cgs@short@Gravity` is Newton's gravitational constant in cgs units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@short@Gravity
\makeatother
```

Resulting in

The value is $6.67 \times 10^{-8}\,\mathrm{dyn\,g^{-2}\,cm^2}$

`\k@cgs@full@Gravity` `\k@cgs@full@Gravity` is Newton's gravitational constant in cgs units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@full@Gravity
\makeatother
```

Resulting in

The value is $6.674\,30 \times 10^{-8}\,\mathrm{dyn\,g^{-2}\,cm^2}$

`\k@SI@short@GravityNumeric` `\k@SI@short@GravityNumeric` is a mathematical value of Newton's gravitational constant in SI units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@short@GravityNumeric
\makeatother
```

Resulting in

The value is $6.67e-11$

`\k@SI@full@GravityNumeric` `\k@SI@full@GravityNumeric` is a mathematical value of Newton's gravitational constant in SI units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@full@GravityNumeric
\makeatother
```

Resulting in

The value is $6.67430e-11$

`\k@cgs@short@GravityNumeric` `\k@cgs@short@GravityNumeric` is a mathematical value of Newton's gravitational constant in cgs units with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@short@GravityNumeric
\makeatother
```

Resulting in

The value is $6.67e-08$

`\k@cgs@full@GravityNumeric` `\k@cgs@full@GravityNumeric` is a mathematical value of Newton's gravitational constant in cgs units with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@full@GravityNumeric
\makeatother
```

Resulting in

The value is $6.67430e-08$

`\k@SI@short@StefanBoltzmann` `\k@SI@short@StefanBoltzmann` is the Stefan-Boltzmann blackbody constant $\left(\frac{2\pi^5 k_\mathrm{B}}{15h^3c^2}\right)$ in SI units with reduced precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@short@StefanBoltzmann
\makeatother
```

Resulting in

The value is $5.67 \times 10^{-8}\,\mathrm{J\,K^{-4}\,m^{-2}\,s^{-1}}$

`\k@SI@full@StefanBoltzmann` `\k@SI@full@StefanBoltzmann` is the Stefan-Boltzmann blackbody constant $\left(\frac{2\pi^5 k_\mathrm{B}}{15h^3c^2}\right)$ in SI units with full precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@full@StefanBoltzmann
\makeatother
```

Resulting in

The value is $5.670\,374 \times 10^{-8}\,\mathrm{J\,K^{-4}\,m^{-2}\,s^{-1}}$

`\k@cgs@short@StefanBoltzmann` `\k@cgs@short@StefanBoltzmann` is the Stefan-Boltzmann blackbody constant $\left(\frac{2\pi^5 k_\mathrm{B}}{15h^3c^2}\right)$ in cgs units with reduced precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@short@StefanBoltzmann
\makeatother
```

Resulting in

The value is $5.67 \times 10^{-5}\,\mathrm{erg\,K^{-4}\,cm^{-2}\,s^{-1}}$

`\k@cgs@full@StefanBoltzmann` `\k@cgs@full@StefanBoltzmann` is the Stefan-Boltzmann blackbody constant $\left(\frac{2\pi^5 k_\mathrm{B}}{15h^3c^2}\right)$ in cgs units with full precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@full@StefanBoltzmann
\makeatother
```

Resulting in

The value is $5.670\,374 \times 10^{-5}\,\mathrm{erg\,K^{-4}\,cm^{-2}\,s^{-1}}$

`\k@SI@short@StefanBoltzmannNumeric` `\k@SI@short@StefanBoltzmannNumeric` is a mathematical value of the Stefan-Boltzmann blackbody constant $\left(\frac{2\pi^5 k_\mathrm{B}}{15h^3c^2}\right)$ in SI units with reduced precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@short@StefanBoltzmannNumeric
\makeatother
```

Resulting in

The value is $5.67e-08$

\k@SI@full@StefanBoltzmannNumeric \k@SI@full@StefanBoltzmannNumeric is a mathematical value of the Stefan-Boltzmann blackbody constant $\left(\frac{2\pi^5 k_B}{15h^3c^2}\right)$ in SI units with full precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@full@StefanBoltzmannNumeric
\makeatother
```

Resulting in

The value is $5.670374e-08$

\k@cgs@short@StefanBoltzmannNumeric \k@cgs@short@StefanBoltzmannNumeric is a mathematical value of the Stefan-Boltzmann blackbody constant $\left(\frac{2\pi^5 k_B}{15h^3c^2}\right)$ in cgs units with reduced precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@short@StefanBoltzmannNumeric
\makeatother
```

Resulting in

The value is $5.67e-05$

\k@cgs@full@StefanBoltzmannNumeric \k@cgs@full@StefanBoltzmannNumeric is a mathematical value of the Stefan-Boltzmann blackbody constant $\left(\frac{2\pi^5 k_B}{15h^3c^2}\right)$ in cgs units with full precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@full@StefanBoltzmannNumeric
\makeatother
```

Resulting in

The value is $5.670374e-05$

`\k@SI@short@Radiation` `\k@SI@short@Radiation` is the radiation constant, $a\left(\frac{8\pi^5 k_{\mathrm{B}}^4}{15c^3h^3}\right)$ in SI units with reduced precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@short@Radiation
\makeatother
```

Resulting in

The value is $7.57 \times 10^{-16}\,\mathrm{J\,m^{-3}\,K^{-4}}$

`\k@SI@full@Radiation` `\k@SI@full@Radiation` is the radiation constant, $a\left(\frac{8\pi^5 k_{\mathrm{B}}^4}{15c^3h^3}\right)$ in SI units with full precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@full@Radiation
\makeatother
```

Resulting in

The value is $7.565\,733 \times 10^{-16}\,\mathrm{J\,m^{-3}\,K^{-4}}$

`\k@cgs@short@Radiation` `\k@cgs@short@Radiation` is the radiation constant, $a\left(\frac{8\pi^5 k_{\mathrm{B}}^4}{15c^3h^3}\right)$ in cgs units with reduced precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@short@Radiation
\makeatother
```

Resulting in

The value is $7.57 \times 10^{-15}\,\mathrm{erg\,cm^{-3}\,K^{-4}}$

`\k@cgs@full@Radiation` `\k@cgs@full@Radiation` is the radiation constant, $a\left(\frac{8\pi^5 k_\mathrm{B}^4}{15c^3h^3}\right)$ in cgs units with full precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@full@Radiation
\makeatother
```

Resulting in

The value is $7.565\,733 \times 10^{-15}\,\mathrm{erg\,cm^{-3}\,K^{-4}}$

`\k@SI@short@RadiationNumeric` `\k@SI@short@RadiationNumeric` is a mathematical value of the radiation constant, $a\left(\frac{8\pi^5 k_\mathrm{B}^4}{15c^3h^3}\right)$ in SI units with reduced precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@short@RadiationNumeric
\makeatother
```

Resulting in

The value is $7.57e-16$

`\k@SI@full@RadiationNumeric` `\k@SI@full@RadiationNumeric` is a mathematical value of the radiation constant, $a\left(\frac{8\pi^5 k_\mathrm{B}^4}{15c^3h^3}\right)$ in SI units with full precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@SI@full@RadiationNumeric
\makeatother
```

Resulting in

The value is $7.565733e-16$

`\k@cgs@short@RadiationNumeric` `\k@cgs@short@RadiationNumeric` is a mathematical value of the radiation constant, $a\left(\frac{8\pi^5 k_\mathrm{B}^4}{15c^3h^3}\right)$ in cgs units with reduced precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@short@RadiationNumeric
\makeatother
```

Resulting in

The value is $7.57e-15$

`\k@cgs@full@RadiationNumeric` `\k@cgs@full@RadiationNumeric` is a mathematical value of the radiation constant, $a\left(\frac{8\pi^5 k_{\mathrm{B}}^4}{15c^3h^3}\right)$ in cgs units with full precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@cgs@full@RadiationNumeric
\makeatother
```

Resulting in

The value is $7.565733e-15$

`\k@short@FineStructure` `\k@short@FineStructure` is the fine structure constant with reduced precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@short@FineStructure
\makeatother
```

Resulting in

The value is 7.30×10^{-3}

`\k@full@FineStructure` `\k@full@FineStructure` is the fine structure constant with full precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@full@FineStructure
\makeatother
```

Resulting in

The value is $7.297\,352\,57 \times 10^{-3}$

\k@short@FineStructureNumeric `\k@short@FineStructureNumeric` is a mathematical value of the fine structure constant with reduced precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@short@FineStructureNumeric
\makeatother
```

Resulting in

The value is $7.30e-03$

\k@full@FineStructureNumeric `\k@full@FineStructureNumeric` is a mathematical value of the fine structure constant with full precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@full@FineStructureNumeric
\makeatother
```

Resulting in

The value is $7.29735257e-03$

\k@short@FineStructureReciprocal `\k@short@FineStructureReciprocal` is the reciprocal of the fine structure constant with reduced precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@short@FineStructureReciprocal
\makeatother
```

Resulting in

The value is 1.37×10^{2}

\k@full@FineStructureReciprocal `\k@full@FineStructureReciprocal` is the reciprocal of the fine structure constant with full precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@full@FineStructureReciprocal
\makeatother
```

Resulting in

The value is $1.370\,359\,99 \times 10^{2}$

\k@short@FineStructureReciprocalNumeric

\k@short@FineStructureReciprocalNumeric is a mathematical value of the reciprocal of the fine structure constant with reduced precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@short@FineStructureReciprocalNumeric
\makeatother
```

Resulting in

The value is $1.37e+02$

\k@full@FineStructureReciprocalNumeric

\k@full@FineStructureReciprocalNumeric is a mathematical value of the reciprocal of the fine structure constant with full precision. (Calculated)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@full@FineStructureReciprocalNumeric
\makeatother
```

Resulting in

The value is $1.37035999e+02$

\k@short@Avogadro

\k@short@Avogadro is Avogadro's Number (the number of particles in a mole) with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@short@Avogadro
\makeatother
```

Resulting in

The value is 6.02×10^{23}

`\k@full@Avogadro` `\k@full@Avogadro` is Avogadro's Number (the number of particles in a mole) with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@full@Avogadro
\makeatother
```

Resulting in

The value is $6.022\,140\,76 \times 10^{23}$

`\k@short@AvogadroNumeric` `\k@short@AvogadroNumeric` is a mathematical value of Avogadro's Number (the number of particles in a mole) with reduced precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@short@AvogadroNumeric
\makeatother
```

Resulting in

The value is $6.02e+23$

`\k@full@AvogadroNumeric` `\k@full@AvogadroNumeric` is a mathematical value of Avogadro's Number (the number of particles in a mole) with full precision. (CODATA 2018)

The macro can be invoked by (e.g.)

```
\makeatletter
The value is \k@full@AvogadroNumeric
\makeatother
```

Resulting in

The value is $6.02214076e+23$

Change History

Index