Discrete & Continuous Models
& Applied Computational Science
ISSN 2658-7149 (Online), 2658-4670 (Print)

2026, 34 (1) 5–11
http://journals.rudn.ru/miph

Editorial

DOI: 10.22363/2658-4670-2026-34-1-5-11 EDN: VDNGIA

Physical dimensional quantities typesetting

Dmitry S. Kulyabov[1,2], Anna V. Korolkova[1], Leonid A. Sevastianov[1,2], Yuri P. Rybakov[1]

[1] RUDN University, 6 Miklukho-Maklaya St, Moscow, 117198, Russian Federation

[2] Joint Institute for Nuclear Research, 6 Joliot-Curie St, Dubna, 141980, Russian Federation

Abstract. The `siunitx` package is designed for typographically correct and consistent typesetting of physical quantities (numbers with units of measurement) in LaTeX documents. It automates formatting according to the rules of the International System of Units (SI), eliminating the need to manually manage spaces, fonts, and separators.

Key words and phrases: unit typesetting, LaTeX

For citation: Kulyabov, D. S., Korolkova, A. V., Sevastianov, L. A., Rybakov, Y. P. Physical dimensional quantities typesetting. *Discrete and Continuous Models and Applied Computational Science* **34** (1), 5–11. doi: 10.22363/2658-4670-2026-34-1-5-11. edn: VDNGIA (2026).

1. Introduction

We use version 3 of the `siunitx` package. In version 3, the core commands of the `siunitx` package have changed:

- Old syntax (v2): **`\SI`**`{number}{unit}` and **`\si`**`{unit}`.
- New syntax (v3): **`\qty`**`{number}{unit}` and **`\unit`**`{unit}`.

Global formatting settings for the entire document are set with the **`\sisetup`** command in the preamble.

For example, Russian-language texts often require a comma as a decimal separator:

```
\sisetup{
locale = DE, % or output-decimal-marker = {,}
}
```

Here, the `locale = DE` option will automatically adjust the format for German (and many other European languages), using a comma as a decimal separator and a period to separate groups of thousands.

2. Basic commands

The package provides three basic commands.

- **`\num`**`{<number>}` — for formatting numbers only:

Formatting Numbers

```
\num{12345.67890}\\
\num{1.34e{-12}}
```

12 345.678 90
1.34×10^{-12}

The command automatically inserts spaces between digit groups, handles scientific notation, and replaces decimal points with commas, if configured.

– **\unit**{<unit>} — for formatting units only.

Formatting Units of Measurement

```
\unit{\kilogram\metre\per\second}\\
\unit{kg.m/s^{2}}
```

$\mathrm{kg\,m\,s^{-1}}$
$\mathrm{kg\,m/s^{2}}$

Units can be entered using special macros (**\kilogram**, **\metre**) or plain text. The package will automatically convert the font to roman (not italic) and insert the correct spacing. To multiply units, use a period (.), and to divide units, use **\per** or the / symbol.

– **\qty**{<number>}{<unit>} is the basic command for outputting a quantity (number + unit). It combines the actions of **\num** and **\unit**.

Formatting Units

```
\qty{9.81}{\metre\per\second\squared}\\
\qty{100}{\kilo\metre\per\hour}
```

$\mathrm{9.81\,m\,s^{-2}}$
$\mathrm{100\,km\,h^{-1}}$

3. Additional commands

For more complex cases, separate commands are provided.

– Angles (degrees, minutes, seconds):

Angles

```
\ang{47.99}\\
\ang{47;59;43.373}
```

47.99°
47°59′43.373″

– Lists of Values:

Lists of Values

```
\qtylist{10;20;30}{\milli\metre}\\
\numlist{10;20;30}
```

10 mm, 20 mm and 30 mm
10, 20 and 30

– Ranges of Values:

Ranges of Values

```
\qtyrange{10}{100}{\metre}\\
\numrange{5}{15}
```

10 m to 100 m
5 to 15

– Product of quantities:

Product of quantities

```
\qtyproduct{2x3x4}{\centi\metre}
```

2 cm × 3 cm × 4 cm

– Commands for complex numbers:

Complex numbers

```
\complexnum{1+2i}\\
\complexqty{1+2i}{\metre}
```

1 + 2i
(1 + 2i) m

4. Tables

One of the features of `siunitx` is the ability to align numbers in tables by decimal separators.

For this, a special column type, `S`, is used.

Working with tables

```
\begin{tabular}{S S}
  {Speed (m/s)} & {Time (s)} \\
  \midrule
  1.23 & 45.6 \\
  0.012 & 789.1 \\
  123 & 0.001 \\
\end{tabular}
```

Speed (m/s)	Time (s)
1.23	45.6
0.012	789.1
123	0.001

The numbers in both columns will be aligned so that the decimal separators (periods or commas) are located below each other. Text in column headings should be enclosed in curly braces to prevent it from trying to align as a number.

Can be used in conjunction with the `tabularray` [1] package.

For this to work, you must include `tabularray` and explicitly load its `siunitx` library. This is done with the **`\UseTblrLibrary`**`{siunitx}` command. The `siunitx` package will be loaded automatically. To pass global options to `siunitx`, the **`\PassOptionsToPackage`** command must be used before loading the library.

```
\documentclass{article}
\PassOptionsToPackage{locale=DE}{siunitx}
\usepackage{tabularray}
\UseTblrLibrary{siunitx} % This command will load siunitx with the options
↪ specified above.
```

```
\begin{document}
\end{document}
```

The main strength of `siunitx` in tables is the ability to align numbers by decimal separators using a column of type `S`. In `tabularray`, this column becomes available after including the library. In the `colspec` argument, you can use `S` just like in regular LaTeX tables. The header must be enclosed in curly braces to prevent it from being aligned as a number.

Tabularray Table

```
\begin{tblr}{ colspec = { l S } }
  Element & {Value} \\
  A & 123.456 \\
  B & 2.34 \\
  C & 5678.9 \\
\end{tblr}
```

Element	Value
A	123.456
B	2.34
C	5678.9

Thanks to built-in support, you can use almost all the capabilities of `siunitx` within `tabularray`.

You can set column-specific `siunitx` options directly in `colspec`, for example, to control the number of characters.

Tabularray Table

```
\begin{tblr}{ colspec = { S[table-format=3.2] } }
  12.3 \\
  456.78 \\
  9.01 \\
\end{tblr}
```

12.3
456.78
9.01

Since `siunitx` is loaded, you can use its commands in table cells. For example, you can separate units of measurement into a separate column and format them using **`\unit`**.

Tabularray Table

```
\begin{tblr}{
    colspec = { S[table-format=1.3] l }, % The first column is numbers, the second is
     ↪ for \unit commands
    column{2} = { cmd = \unit }, % The contents of the second column will be the
     ↪ argument for \unit
  }
  \SetCell[r=1,c=2]{c} {Physical~quantities} \\ % Combined header
  1.234 & \metre                  \\
  0.835 & \candela                \\
  4.23  & \joule\per\mole         \\
\end{tblr}
```

Physical quantities	
1.234	m
0.835	cd
4.23	$\mathrm{J\,mol^{-1}}$

5. Global settings

Here are some useful options for **\sisetup**.

- `locale = DE` — quick setup for European standards (comma, spaces).
- `output-decimal-marker = {,}` — explicitly set the comma as the decimal separator.
- `group-separator = {\,}` — set the character to separate groups of digits (e.g., thin space).
- `range-phrase = {\,--\,}` — set the text for the range (default: “to”, can be replaced with a dash).
- `per-mode = symbol` — how to display a symbol to the minus first power: $/s$ instead of s^{-1}. You can also use `fraction` to display it as a fraction.
- `exponent-mode = scientific` — force all numbers to scientific notation.

Author Contributions: The contributions of the authors are equal. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Data Availability Statement: No new data were created or analysed during this study. Data sharing is not applicable.

Conflicts of Interest: The authors declare no conflict of interest.

Declaration on Generative AI: The authors have not employed any Generative AI tools.

References

1. Kulyabov, D. S., Korolkova, A. V., Sevastianov, L. A. & Rybakov, Y. P. Typesetting tables. *Discrete and Continuous Models and Applied Computational Science* **33,** 235–241. doi:10.22363/2658-4670-2025-33-3-235-241 (Oct. 2025).

Information about the authors

Kulyabov, Dmitry S.—Professor, Doctor of Sciences in Physics and Mathematics, Professor of Department of Probability Theory and Cyber Security of RUDN University; Senior Researcher of Laboratory of Information Technologies, Joint Institute for Nuclear Research (e-mail: kulyabov-ds@rudn.ru, ORCID: 0000-0002-0877-7063, ResearcherID: I-3183-2013, Scopus Author ID: 35194130800)

Korolkova, Anna V.—Docent, Candidate of Sciences in Physics and Mathematics, Associate Professor of Department of Probability Theory and Cyber Security of RUDN University (e-mail: korolkova-av@rudn.ru, ORCID: 0000-0001-7141-7610, ResearcherID: I-3191-2013, Scopus Author ID: 36968057600)

Sevastianov, Leonid A.—Professor, Doctor of Sciences in Physics and Mathematics, Professor of Department of Computational Mathematics and Artificial Intelligence of RUDN University (e-mail: sevastianov-la@rudn.ru, ORCID: 0000-0002-1856-4643, ResearcherID: B-8497-2016, Scopus Author ID: 8783969400)

Rybakov, Yuri P.—Professor, Doctor of Sciences in Physics and Mathematics, Professor of the Institute of Physical Research and Technologies of RUDN University (e-mail: rybakov-yup@rudn.ru, ORCID: 0000-0002-7744-9725, ResearcherID: S-4813-2018, Scopus Author ID: 16454766600)

DOI: 10.22363/2658-4670-2026-34-1-5-11 EDN: VDNGIA

Набор физических размерных величин

Д. С. Кулябов[1,2], А. В. Королькова[1], Л. А. Севастьянов[1,2], Ю. П. Рыбаков[1]

[1] Российский университет дружбы народов, ул. Миклухо-Маклая, д. 6, Москва, 117198, Российская Федерация

[2] Объединённый институт ядерных исследований, ул. Жолио-Кюри, д. 6, Дубна, 141980, Российская Федерация

Аннотация. Пакет `siunitx` предназначен для типографски правильного и согласованного набора физических величин (чисел с единицами измерения) в документах LaTeX. Он автоматизирует форматирование в соответствии с правилами Международной системы единиц (СИ), что избавляет от необходимости вручную следить за пробелами, шрифтами и разделителями.

Ключевые слова: набор физических единиц, LaTeX