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

2025, 33 (3) 235–241
http://journals.rudn.ru/miph

Editorial

DOI: 10.22363/2658-4670-2025-33-3-235-241 EDN: HLVCTH

Typesetting tables

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. Recommendations are provided for the typesetting of tabular material in the journal in order to standardize its appearance.

Key words and phrases: table, table typesetting, LaTeX

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

1. General recommendations for table typesetting

Tables are used to organize and visually present data in a structured format. They should contain clearly defined and comparable data, logically distributed across columns and rows.

- Rows contain different objects or records.
- Columns represent parameters or characteristics (e.g., numeric values, text).

It's important that the data is consistent within columns and well-structured for easy comprehension.

The table's appearance should be legible: clearly delineated columns and rows, column headings, and, if necessary, dividing lines. Tables shouldn't be cluttered: too many columns or rows make the table difficult to read.

1.1. Recommendations

- Avoid using excessively long text in cells—it reduces readability.
- Align data logically: text should generally be left-aligned, and numbers should be right-aligned or centered.
- Column headings should be informative but short.
- Avoid unnecessary borders and lines.

2. Typesetting of tables in LaTeX

LaTeX table layout tools are well-documented in the literature [1].

We'll give a brief overview of the LaTeX packages used for table typesetting (see Table 1).

You can refer to the CTAN (Comprehensive TeX Archive Network) category: https://ctan.org/topic/table.

Table 1

Using LaTeX packages for typesetting tables

Package	Features	When to Use
`tabular`	Basic syntax, minimal settings	Simple tables
`array`	Extended columns (p, m, b)	Tables with text
`tabularx`	Automatic width adaptation	Long tables
`booktabs`	Professional lines	Scientific publications
`tabularray`	Full control through key parameters	Complex layouts, templates

2.1. List of packages

2.1.1. Array package

- CTAN: https://ctan.org/pkg/array.
- Allows you to define new column styles.
- Can be used with other packages to extend their functionality.

2.1.2. Tabularx package

- CTAN: https://ctan.org/pkg/tabularx.
- Extension to the tabular package.
- Allows the creation of columns with automatically balanced widths.
- Introduces an additional column type, `X`.
- Creates a paragraph-like column whose width automatically expands to fill the declared environment width.

2.1.3. Tabulary package

- CTAN: https://ctan.org/pkg/tabulary.
- Similar to *tabularx*.
- Uses the full width of the table as an argument.
- Uses the `L`, `C`, `R`, and `J` column types for variable-width columns.
- Unlike `X` columns in *tabularx*, the width of each column is weighted according to the natural width of the widest cell in the column.

2.1.4. Longtable package

- CTAN: https://ctan.org/pkg/longtable.
- Allows you to create tables that continue onto the next page.
- Columns on consecutive pages have the same width.
- Unlike *supertabular*, it modifies the output procedure and therefore will not work in a multicolumn environment.

2.1.5. Booktabs package

- CTAN: https://ctan.org/pkg/booktabs.
- Open tables with extra spaces between rows.
- Longtable compatible.

2.1.6. Tabularray package

- CTAN: https://ctan.org/pkg/tabularray.
- Repository: https://github.com/lvjr/tabularray.
- Written in LaTeX3.
- Directly uses LaTeX3 functions to parse tables.
- Separates table content and style.
- Table style can be completely specified using keys.
- This package is recommended for typesetting tables.

3. Using the tabularray package

3.1. Features of the tabularray package

Keyword syntax is used. Tables are configured using keyword parameters in the `tblr` environment, making the code more readable:

```
\begin{tblr}{
  colspec = {rX},
  colsep = 8mm,
  hlines = {2pt, white},
  row{odd} = {azure8},
  row{even} = {gray8},
}
```

Flexible column and row settings:

- Dynamic alignment: automatic column width detection with manual adjustment.
- Color and formatting: built-in commands for cell shading and font changes:

```
\SetCell{bg=green9} Yes & \SetCell{bg=red8} No
```

- Support for complex structures.
- Macro expansion: Allows the use of complex structures within tables, including dynamic data.
- Integration with `booktabs`: Compatible with professional table styling via the `booktabs` package.

3.2. Basic principles of table construction

Use `colspec` to define column types:

```
\begin{tblr}{colspec={X[l] X[c] X[r]}}
```

- `X[l]`: Left-aligned column with automatic width.
- `c`, `r`: Centered and right-aligned, respectively.

Appearance settings:

- Horizontal lines: `hlines`, `hline{1}={blue, dashed}`.
- Vertical lines: `vlines`, `vline{1,4}={3pt}`.
- Cell background color: **`\SetCell`**`{bg=green9}`.

3.3. Integration with the booktab package

It makes sense to use the expressiveness of `tabularray` in `booktabs` (see Table 2).

3.3.1. Loading the booktabs library

Add the following command to the document's preamble:

`\UseTblrLibrary``{booktabs}`

- This enables compatibility with `booktabs`, allowing its commands to be used within the `tblr` environment.
- For multi-page tables, use the `longtblr` environment with the same style settings.
- Avoid vertical lines—they are contrary to professional design principles.
- Adjust the line thickness using the `rule thickness` parameter to closely match the `booktabs` style.

3.3.2. Basic elements of booktabs style

Commands for horizontal lines:

- **`\toprule`** — top line;
- **`\midrule`** — middle line;
- **`\bottomrule`** — bottom line.

Example setup:

Example of using booktabs

```
\begin{tblr}{
colspec = {ccc},
hline = {white}, % Disable standard horizontal lines
vlines = {0pt}, % Disable vertical lines (they are not present in the booktabs style)
}
\toprule
Header 1 & Header 2 & Header 3 \\
\midrule
Data 1 & Data 2 & Data 3 \\
\bottomrule
\end{tblr}
```

Header 1	Header 2	Header 3
Data 1	Data 2	Data 3

3.3.3. Example of a complete table

Let's give an example of a complete table set:

Table 2

Comparing tabularray with booktabs

Function	**tabularray**	**booktabs**
Syntax	Key parameters in the `tblr` environment	Traditional syntax `tabular`
Lines	**`\toprule`**, **`\midrule`**, **`\bottomrule`**	Same commands
Vertical lines	Not recommended	Disabled by default
Multipage tables	`longtblr` environment	`longtable` package

Example of a table in the booktabs style

```
\begin{tblr}{
colspec = {X[l] X[r] X[c]},
hline = {white},
vlines = {0pt},
row{1} = {font=\bfseries}, % Bold for headings
}
\toprule
Parameter & Value & Unit \\
\midrule
Length & 10.5 & m \\
Width & 2.3 & cm \\
Height & 5.1 & mm \\
\bottomrule
\end{tblr}
```

Parameter	**Value**	**Unit**
Length	10.5	m
Width	2.3	cm
Height	5.1	mm

3.4. Integration with the siunitx package

Loading:

```
\UseTblrLibrary{siunitx}
```

Add:

- key `si` for column type `Q`;
- column type `S` (like sugar for `Q` columns, centered by default).

Let's align it with the decimal point:

Align with the decimal point

```
\begin{tblr}{
  hlines, vlines,
  colspec =
   ↪ {Q[si={table-format=3.2},c]
   ↪ Q[si={table-format=3.2},c]},
  row{1} = {guard}
  }
  Head  & Head \\
  111 & 111 \\
  2.1 & 2.2 \\
  33.11 & 33.22 \\
\end{tblr}
```

Head	Head
111	111
2.1	2.2
33.11	33.22

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. Mittelbach, F., Goossens, M., Braams, J., Carlisle, D. & Rowley, C. *The LaTeX Companion* 2nd ed. 1120 pp. (Addison-Wesley Professional, 2004).

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.—Doctor of Physical and Mathematical Sciences, 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: 10.22363/2658-4670-2025-33-3-235-241 EDN: HLVCTH

Набор таблиц

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. Предлагаются рекомендации по набору табличного материала в журнале с целью унификации внешнего вида.

Ключевые слова: таблицы, набор таблиц, LaTeX