

Guidelines for MSAS reports in L^AT_EX

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1 Guidelines

This document gives some advices in order to write the MSAS reports in L^AT_EX, e.g., packages, commands, and stylistic guidelines. The reader is referred to the *source code* in `main.tex`.

The topics described are:

- Tables (Section 1.1);
- Figures and file formats (Section 1.2);
- Equations (Section 1.3);
- Bibliography (Section 1.4).

Part of the material that follows is re-worked starting from guidelines produced by the American Institute of Aeronautics and Astronautics (AIAA) for journal authors (website: <https://www.aiaa.org/journal-authors/#Prepare>).

There are a multitude of user's guides for document writing in L^AT_EX, so feel free to use one of these; good examples <https://www.latex-project.org>, <https://tex.stackexchange.com>, and http://www.lorenzopantieri.net/LaTeX_files/ArteLaTeX.pdf (in Italian).

1.1 Tables

Referring to a table should happen before placement of the table itself. All tables are numbered and include a caption (definitive title) at the top. Each table must be cited in the text in numerical order and *before* the table is placed in the text; table footnotes may be used to define acronyms or other terminology within the table (advice: use *threeparttable* package). Do not use border lines or vertical rules between columns, but do use a double rule above and below the body of each table and a single rule under the column headings.

YES! Cite before the table: Table 1 outlines the recommended style for editing table.

Table 1: Example of table.

T_{max} , N	v , m/s ²	x , m
3 [†]	13.57×10^2	1.333×10^{-3}
2	34.78E+03	0.666E-04*

[†] example of footnote

* example, retrieved from [2].

NO! Cite after the table: Table 1 outlines the recommended style for editing table.

1.2 Figures

All figures are numbered and include a caption (definitive title) at the bottom. Each figure must be cited in the text in numerical order and *before* it is represented. You may position them within the text of your article close to where they are cited.

YES! Reference before the figure: Figure 1 shows the overleaf symbol.



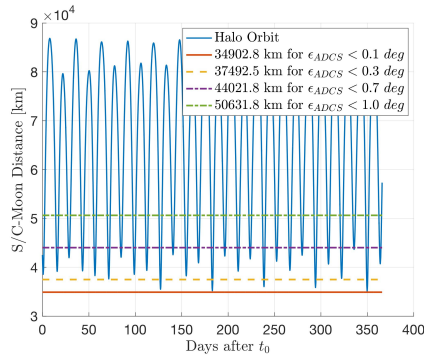
Figure 1: Example of figure.

NO! Reference after the figure: Figure 1 shows the overleaf symbol.

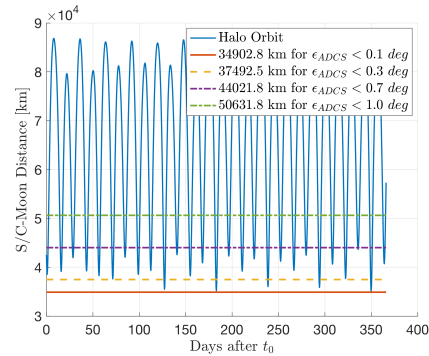
1.2.1 Image file formats

Note the difference among different image file formats in Figure 2 (zoom-in the complied figures in main.pdf). If possible, use the .eps format. For example, in MATLAB, use the “export setup” MATLAB command when you save an image.

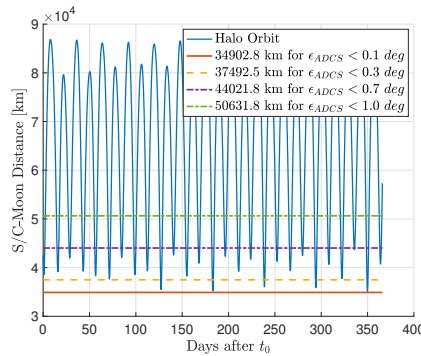
Note also the different line style of the legend: you should produce a legend that is color agnostic, i.e., legend adapted for black and white papers or color blind readers. When figures are retrieved from the literature, cite the source (see Figure 2c).



(a) JPG image



(b) PNG image



(c) EPS image, retrieved from [1].

Figure 2: Possible image file formats.

1.3 Equations

Keep equations simple, and avoid unusual characters or symbols. Tips: 1) avoid using underbarred symbols, 2) Avoid using multiple dot accents (in excess of two). Use boldface symbol for vector quantities and capital letter for matrices. Contrary to what stated for figures and tables in the previous Sections, equations can be referred to also *after* they are presented. A list of equations with various layout is represented hereinafter: try to adapt the style to what you are writing about. For example, if the canonical state space representation is needed for a system of equations, a good idea is to align the right-hand side of each variable.

$$\mathbf{M} \ddot{\mathbf{x}} + \mathbf{C} \dot{\mathbf{x}} + \mathbf{K} \mathbf{x} = \mathbf{F} \quad (1)$$

$$3\mathbf{x} + 4\mathbf{y} = \mathbf{c} \quad (2)$$

$$\mathbf{z} = \mathbf{f}(\mathbf{x}, \mathbf{y}) \quad (3)$$

$$\begin{cases} 2x + y = 1 & (4) \\ 8xy = 12 & (5) \\ 12x/c = 10 & (6) \end{cases}$$

$$\dot{\mathbf{x}} = \mathbf{f}(\mathbf{x}, \mathbf{y}) \quad (7a)$$

$$\dot{\mathbf{y}} = \mathbf{g}(\mathbf{x}, \mathbf{y}) \mathbf{x} \quad (7b)$$

In some limited cases (e.g. intermediate steps of a demonstration), equations can be also unreferenced:

$$f(x) = f(x_0) + \frac{f'(x_0)}{1!}(x - x_0) + \frac{f''(x_0)}{2!}(x - x_0)^2 + o((x - x_0)^2)$$

$$\text{vec} \left(\frac{d\sqrt{\mathbf{A}}}{dx} \right) = \left(\sqrt{\mathbf{A}}^T \oplus \sqrt{\mathbf{A}} \right)^{-1} \text{vec} \left(\frac{d\mathbf{A}}{dx} \right)$$

1.4 Bibliography

All references must be numbered and cited in numerical order in the text. The original source of a work must be cited, not a secondary source. The Digital Object Identifier should be incorporated into every reference whenever possible.

References

- [1] F. Topputo et al. *Lunar Meteoroid Impacts Observer*. Tech. rep. 2017.
- [2] C. Zhang et al. “Low-thrust minimum-fuel optimization in the circular restricted three-body problem”. In: *Journal of Guidance, Control, and Dynamics* 38.8 (2015), pp. 1501–1510. DOI: 10.2514/1.6001080.