

# Preparation of Papers for IEPC 2022

## IEPC-2022-XXX

*Presented at the 37th International Electric Propulsion Conference  
Massachusetts Institute of Technology, Cambridge, MA, USA  
June 19-23, 2022*

First A. Author<sup>1</sup> and Second B. Author Jr.<sup>2</sup>

*Business or Academic Affiliation's Full Name 1, City, State, Zip Code, Country*

Third C. Author<sup>3</sup>

*Business or Academic Affiliation's Full Name 2, City, Province, Zip Code, Country*

Fourth D. Author<sup>4</sup>

*Business or Academic Affiliation's Full Name 2, City, State, Zip Code, Country*

**These instructions give you guidelines for preparing your paper for IEPC 2022. Otherwise, use this document as an instruction set. Define all symbols used in the abstract. Do not cite references in the abstract. The footnote on the first page should list the Job Title, Department, and Email Address for all authors.**

## I. Nomenclature

$m_i$  = ion mass  
 $n_e$  = electron density  
 $T_e$  = electron temperature

## II. Introduction

You may choose section headings as appropriate for your work. Formatting and information contained in this template are adapted from the AIAA Conference Paper guidelines.

## III. Procedure for Paper Submission

All manuscripts are to be submitted electronically through the Electric Rocket Society Paper submission portal, which can be accessed at: <https://www.electricrocket.org/index.php?page=2022-paper-submission>. **Files will only be accepted in PDF format.**

First authors of accepted papers will receive an email with instructions when manuscript submission opens. It is important that presenting authors keep their email addresses up-to-date so they do not miss this notice.

**All files must be in PDF format. Please be sure that all security settings are removed from the PDF file before uploading to ensure proper processing of your manuscript file.**

## IV. General Guidelines

The following section outlines general (nonformatting) guidelines to follow. These guidelines are applicable to all authors (except as noted), and include information on the policies and practices relevant to the publication of your manuscript.

---

<sup>1</sup>Insert Job Title, Department Name, and Email Address for first author.

<sup>2</sup>Insert Job Title, Department Name, and Email Address for second author.

<sup>3</sup>Insert Job Title, Department Name, and Email Address for third author.

<sup>4</sup>Insert Job Title, Department Name, and Email Address for fourth author (etc.).

## A. Publication in Conference Proceedings

Your manuscript *cannot* be published by ERPS if:

- 1) It has been published previously, or
- 2) The work contains copyright-infringing material, or
- 3) An appropriate copyright statement has not yet been selected

## B. Paper Review and Visa Considerations

It is the responsibility of the author to obtain any required government or company reviews for their papers in advance of publication. Start early to determine if the reviews are required; this process can take several weeks.

If you plan to attend a technical conference or professional development course held in the United States and you require a visa for travel, it is incumbent upon you to apply for a visa with the U.S. embassy (consular division) or consulate with ample time for processing. To avoid bureaucratic problems, the organizers suggest that you submit your formal application to U.S. authorities a minimum of 120 days in advance of the date of anticipated travel.

## C. Submission Deadlines

Manuscripts will be accepted for upload to the system from the receipt of the email invitation until the deadline set for the conference. **Please review your manuscript very carefully before completing your submission to ensure that your paper is complete and final in all respects. It will not be possible to edit your submitted manuscript.**

To ensure conference quality, session chairs will enforce a “no paper, no podium” rule. This policy is intended to eliminate no-shows, to improve the quality of the conference for all participants, and to ensure that the published proceedings accurately represent the presentations made at a conference. **We are currently exploring options for those who cannot make it here due to visa restrictions related to COVID-19.**

**Table 1** Conference key dates.

Abstract submission opens	September 7th, 2021
Abstract deadline	November 30th, 2021
Notification of acceptances	March 1st, 2022
Deadline for full paper submission	June 19th, 2022
Conference dates	June 19th-23rd, 2022

## V. Detailed Formatting Instructions

The styles and formats for the AIAA Papers Template have been incorporated into the structure of this document. If you are using  $\LaTeX$ , please use this template to prepare your manuscript. A Microsoft Word template is also available from the conference website if you prefer to use Microsoft Word 2001 or later. Regardless of which program you use to prepare your manuscript, please use the formatting instructions contained in this document as a guide.

### A. Document Text

The default font for AIAA papers is Times New Roman, 10-point size. The first line of every paragraph should be indented, and all lines should be single-spaced. Default margins are 1” on all sides. In the electronic version of this template, all margins and other formatting is preset. There should be no additional lines between paragraphs.

Extended quotes, such as this example, are to be used when material being cited is longer than a few sentences, or the standard quotation format is not practical. In this  $\LaTeX$  template, the appropriate command environment is `\begin{quoting} . . . \end{quoting}`. Extended quotes are to be in Times New Roman, 9-point font, indented 0.4” and full justified.

*NOTE:* If you are using the electronic  $\LaTeX$  template to format your manuscript, the required spacing and formatting will be applied automatically.

### B. Headings

The title of your paper should be typed in bold, 24-point type, with capital and lower-case letters, and centered at the top of the page. The names of the authors, business or academic affiliation, city, and state/province should follow on

separate lines below the title. The names of authors with the same affiliation can be listed on the same line above their collective affiliation information. Author names are centered, and affiliations are centered and in italic type immediately below the author names. The affiliation line for each author is to include that author's city, state, and zip/postal code (or city, province, zip/postal code and country, as appropriate). The first-page footnotes (lower left-hand side) contain the job title and department name, street address/mail stop, and AIAA member grade for each author. Author email addresses may be included also.

Major headings ("sections" in the L<sup>A</sup>T<sub>E</sub>X template commands) are bold 11-point font, centered, and numbered with Roman numerals.

Subheadings ("subsections" in the L<sup>A</sup>T<sub>E</sub>X template commands) are bold, flush left, and numbered with capital letters.

Sub-Subheadings ("subsubsections" in the L<sup>A</sup>T<sub>E</sub>X template commands) are italic, flush left, and numbered (1. 2. 3. etc.)

### **C. Abstract**

The abstract should appear at the beginning of your paper. It should be one paragraph long (not an introduction) and complete in itself (no reference numbers). It should indicate subjects dealt with in the paper and state the objectives of the investigation. Newly observed facts and conclusions of the experiment or argument discussed in the paper must be stated in summary form; readers should not have to read the paper to understand the abstract. The abstract should be bold, indented 3 picas (1/2") on each side, and separated from the rest of the document by blank lines above and below the abstract text..

### **D. Nomenclature**

Papers with many symbols may benefit from a nomenclature list that defines all symbols with units, inserted between the abstract and the introduction. If one is used, it must contain all the symbology used in the manuscript, and the definitions should not be repeated in the text. In all cases, identify the symbols used if they are not widely recognized in the profession. Define acronyms in the text, not in the nomenclature.

### **E. Footnotes and References**

Footnotes, where they appear, should be placed above the 1" margin at the bottom of the page. To insert footnotes into the template, use the Insert>Footnote feature from the main menu as necessary. Numbered footnotes as formatted automatically in the template are acceptable, but superscript symbols are the preferred AIAA style, \*, †, ‡, §, ¶, \*\*, ††, ‡‡, §§, etc.

List and number all references at the end of the paper. Corresponding bracketed numbers are used to cite references in the text [1], including citations that are an integral part of the sentence (e.g., "It is shown in [2] that. . .") or follow a mathematical expression: " $A^2 + B = C$  (Ref. [3])." For multiple citations, separate reference numbers with commas [4, 5], or use a dash to show a range [6–9]. Reference citations in the text should be in numerical order.

In the reference list, give all authors' names; do not use "et al.". Papers that have not been published should be cited as "unpublished"; papers that have been submitted or accepted for publication should be cited as "submitted for publication." Private communications and personal website should appear as footnotes rather than in the reference list.

References should be cited according to the standard publication reference style (for examples, see the "References" section of this template). Never edit titles in references to conform to AIAA style of spellings, abbreviations, etc. Names and locations of publishers should be listed; month and year should be included for reports and papers. For papers published in translation journals, please give the English citation first, followed by the original foreign language citation.

### **F. Images, Figures and Tables**

All artwork, captions, figures, graphs, and tables will be reproduced exactly as submitted. Be sure to position any figures, tables, graphs, or pictures as you want them printed. AIAA will not be responsible for incorporating your figures, tables, etc. (Company logos and identification numbers are not permitted on your illustrations.)

Do not insert your tables and figures in text boxes. Figures should have no background, borders, or outlines. In the L<sup>A</sup>T<sub>E</sub>X template, use the "caption" command to type caption text. Captions are bold with a single tab (no hyphen or other character) between the figure number and figure description.

Place figure captions below all figures; place table titles above the tables. If your figure has multiple parts, include the labels "a)," "b)," etc. below and to the left of each part, above the figure caption. Please verify that the figures



Fig. 1 Logo for IEPC 2022.

and tables you mention in the text actually exist. *Please do not include captions as part of the figures, and do not put captions in separate text boxes linked to the figures.* When citing a figure in the text, use the abbreviation “Fig.” except at the beginning of a sentence. Do not abbreviate “Table.” Number each different type of illustration (i.e., figures, tables, images) sequentially with relation to other illustrations of the same type.

Figure axis labels are often a source of confusion. Use words rather than symbols. As in the example to the right, write the quantity “Magnetization” rather than just “M.” Do not enclose units in parenthesis, but rather separate them from the preceding text by commas. Do not label axes only with units. As in Fig. 1, for example, write “Magnetization, A/m,” not just “A/m.” Do not label axes with a ratio of quantities and units. For example, write “Temperature, K,” not “Temperature/K.”

Multipliers can be especially confusing. Write “Magnetization, kA/m” or “Magnetization,  $1 \times 10^3$  A/m.” Do not write “Magnetization (A/m) x 1000” because the reader would not then know whether the top axis label in Fig. 1 meant 16000 A/m or 0.016 A/m. Figure labels must be legible, and all text within figures should be uniform in style and size, no smaller than 8-point type.

### G. Equations, Numbers, Symbols, and Abbreviations

Equations are numbered consecutively, with equation numbers in parentheses flush right, as in Eq. (1). Insert a blank line above and below the equation. To insert an equation into the  $\LaTeX$  document, use the `\begin{equation} . . . \end{equation}` command environment.

A sample equation is included here, formatted using the preceding instructions. To make your equation more compact, you can use the solidus (*/*), the exp function, or appropriate exponents. Use parentheses to avoid ambiguities in denominators.

$$\int_0^{r_2} F(r, \varphi) dr d\varphi = [\sigma r_2 / (2\mu_0)] \int_0^\infty \exp(-\lambda |z_j - z_i|) \lambda^{-1} J_1(\lambda r_2) J_0(\lambda r_i) \lambda d\lambda \quad (1)$$

Be sure that the symbols in your equation are defined before the equation appears, or immediately following. Italicize symbols (*T* might refer to temperature, but *T* is the unit tesla). Refer to “Eq. (1),” not “(1)” or “equation (1)” except at the beginning of a sentence: “Equation (1) is. . .” Equations can be labeled other than “Eq.” should they represent inequalities, matrices, or boundary conditions. If what is represented is really more than one equation, the abbreviation “Eqs.” can be used.

Define abbreviations and acronyms the first time they are used in the text, even after they have already been defined in the abstract. Very common abbreviations such as AIAA, SI, ac, and dc do not have to be defined. Abbreviations that incorporate periods should not have spaces: write “P.R.,” not “P. R.” Delete periods between initials if the abbreviation has three or more initials; e.g., U.N. but ESA. Do not use abbreviations in the title unless they are unavoidable (for instance, “AIAA” in the title of this article).

## H. General Grammar and Preferred Usage

Use only one space after periods or colons. Hyphenate complex modifiers: “zero-field-cooled magnetization.” Avoid dangling participles, such as, “Using Eq. (1), the potential was calculated.” [It is not clear who or what used Eq. (1).] Write instead “The potential was calculated using Eq. (1),” or “Using Eq. (1), we calculated the potential.”

Insert a zero before decimal points: “0.25,” not “.25.” Use “cm<sup>2</sup>” not “cc.” Indicate sample dimensions as “0.1 cm × 0.2 cm,” not “0.1 × 0.2 cm<sup>2</sup>.” The preferred abbreviation for “seconds” is “s,” not “sec.” Do not mix complete spellings and abbreviations of units: use “Wb/m<sup>2</sup>” or “webers per square meter,” not “webers/m<sup>2</sup>.” When expressing a range of values, write “7 to 9” or “7–9,” not “7~9.”

A parenthetical statement at the end of a sentence is punctuated outside of the closing parenthesis (like this). (A parenthetical sentence is punctuated within parenthesis.) In American English, periods and commas are placed within quotation marks, like “this period.” Other punctuation is “outside”! Avoid contractions; for example, write “do not” instead of “don’t.” The serial comma is preferred: “A, B, and C” instead of “A, B and C.”

If you wish, you may write in the first person singular or plural and use the active voice (“I observed that. . .” or “We observed that. . .” instead of “It was observed that. . .”). Remember to check spelling. If your native language is not English, please ask a native English-speaking colleague to proofread your paper.

Be aware of the different meanings of the homophones “affect” (usually a verb) and “effect” (usually a noun), “complement” and “compliment,” “discreet” and “discrete,” “principal” (e.g., “principal investigator”) and “principle” (e.g., “principle of measurement”). Do not confuse “imply” and “infer.”

The word “data” is plural, not singular (i.e., “data are,” not “data is”). The subscript for the permeability of vacuum  $\mu_0$  is zero, not a lowercase letter “o.” The term for residual magnetization is “remanence”; the adjective is “remanent”; do not write “remnance” or “remnant.” The word “micrometer” is preferred over “micron” when spelling out this unit of measure. A graph within a graph is an “inset,” not an “insert.” The word “alternatively” is preferred to the word “alternately” (unless you really mean something that alternates). Use the word “whereas” instead of “while” (unless you are referring to simultaneous events). Do not use the word “essentially” to mean “approximately” or “effectively.” Do not use the word “issue” as a euphemism for “problem.” When compositions are not specified, separate chemical symbols by en-dashes; for example, “NiMn” indicates the intermetallic compound Ni<sub>0.5</sub>Mn<sub>0.5</sub> whereas “Ni–Mn” indicates an alloy of some composition Ni<sub>x</sub>Mn<sub>1–x</sub>.

Be aware of the different meanings of the homophones “affect” (usually a verb) and “effect” (usually a noun), “complement” and “compliment,” “discreet” and “discrete,” “principal” (e.g., “principal investigator”) and “principle” (e.g., “principle of measurement”). Do not confuse “imply” and “infer.”

Prefixes such as “non,” “sub,” “micro,” “multi,” and “ultra” are not independent words; they should be joined to the words they modify, usually without a hyphen. There is no period after the “et” in the abbreviation “et al.” The abbreviation “i.e.,” means “that is,” and the abbreviation “e.g.,” means “for example” (these abbreviations are not italicized).

## VI. Conclusion

A conclusion section is not required, though it is preferred. Although a conclusion may review the main points of the paper, do not replicate the abstract as the conclusion. A conclusion might elaborate on the importance of the work or suggest applications and extensions. *Note that the conclusion section is the last section of the paper that should be numbered. The appendix (if present), acknowledgment, and references should be listed without numbers.*

## Appendix

An Appendix, if needed, should appear before the acknowledgments.

## Acknowledgments

An Acknowledgments section, if used, **immediately precedes** the References. Sponsorship information and funding data are included here. The preferred spelling of the word “acknowledgment” in American English is without the “e” after the “g.” Avoid expressions such as “One of us (S.B.A.) would like to thank. . .” Instead, write “F. A. Author thanks. . .” Sponsor and financial support acknowledgments are also to be listed in the “acknowledgments” section.

## References

- [1] Vatistas, G. H., Lin, S., and Kwok, C. K., "Reverse Flow Radius in Vortex Chambers," *AIAA Journal*, Vol. 24, No. 11, 1986, pp. 1872, 1873. <https://doi.org/10.2514/3.13046>.
- [2] Dornheim, M. A., "Planetary Flight Surge Faces Budget Realities," *Aviation Week & Space Technology*, Vol. 145, No. 24, 1996, pp. 44–46.
- [3] Terster, W., "NASA Considers Switch to Delta 2," *Space News*, Vol. 8, No. 2, 1997, pp. 13–19.
- [4] Peyret, R., and Taylor, T. D., *Computational Methods for Fluid Flow*, 2<sup>nd</sup> ed., Springer-Verlag, New York, 1983, Chaps. 7, 14.
- [5] Oates, G. C. (ed.), *Aerothermodynamics of Gas Turbine and Rocket Propulsion*, AIAA Education Series, AIAA, New York, 1984, pp. 19, 136.
- [6] Volpe, R., "Techniques for Collision Prevention, Impact Stability, and Force Control by Space Manipulators," *Teleoperation and Robotics in Space*, edited by S. B. Skaar and C. F. Ruoff, Progress in Astronautics and Aeronautics, AIAA, Washington, DC, 1994, pp. 175–212.
- [7] Thompson, C. M., "Spacecraft Thermal Control, Design, and Operation," *AIAA Guidance, Navigation, and Control Conference*, CP849, Vol. 1, AIAA, Washington, DC, 1989, pp. 103–115.
- [8] Chi, Y. (ed.), *Fluid Mechanics Proceedings*, NASA SP-255, 1993.
- [9] Brandis, A. M., Johnston, C. O., and Cruden, B. A., "Nonequilibrium Radiation for Earth Entry," *AIAA Paper 2016–3690*, June 2016. <https://doi.org/10.2514/6.2016-3690>.