

Preparation of Papers for IEEE TRANSACTIONS ON MAGNETICS (Revised May 2015)

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These instructions give you guidelines for preparing papers for IEEE TRANSACTIONS ON MAGNETICS. Use this document as a template if you are using Microsoft *Word*. Otherwise, use this document just for helpful information, and prepare your paper using any word processor or LaTeX (the general IEEE LaTeX template is available at www.ieee.org/publications_standards/publications/authors/author_templates.html). This *Word* template is useful for estimating the length of an article but it is optional. The electronic file of your paper will be formatted further at IEEE. Paper titles should be written in uppercase and lowercase letters. Avoid writing long formulas with subscripts in the title; short formulas that identify the elements are fine (e.g., “Nd-Fe-B”). Do not begin a title with the word “On.” Avoid starting a title with articles like “The.” Full names of authors are much preferred but initials may be used instead. Chinese, Japanese, and Korean authors are encouraged to include their names in native characters in parentheses after their Romanized names. More information may be found at www.ieee.org/publications_standards/publications/authors/auth_names_native_lang.pdf. Department names are optional in the affiliations. Do not give street addresses in the affiliations (except for authors with no institutional affiliation). Define all symbols used in the abstract, and again in the text. Do not cite references in the abstract.

Index Terms—About four key words or phrases in alphabetical order, separated by commas.

I. INTRODUCTION

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Authors may prepare their papers for review using any word processor, one or two columns, single or double spaced. Please follow the writing style specified in this document.

When you open TRANSMAG2015.DOC, select “Print Layout” from the “View” menu in the menu bar (View > Print Layout). Then type over sections of TRANSMAG2015.DOC or cut and paste from another document and then use markup styles (Home > Styles). For example, the style at this point in the document is “Text”. Highlight a section that you want to designate with a certain style; then select the appropriate name

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Color versions of one or more of the figures in this paper are available online at <http://ieeexplore.ieee.org>.

Digital Object Identifier (inserted by IEEE).

on the style menu. The style will adjust your fonts and line spacing. Use italics for emphasis; do not underline.

To insert images in *Word*, position the cursor at the insertion point and either use Insert > Picture or copy the image to the Windows clipboard and then Home > Paste. IEEE will do the final formatting of your paper, so do not worry about precisely positioning figures and tables. In fact, they are best placed at the end of the paper, with the proper insertion points indicated in the text.

If you have a question about formatting your paper, or a suggestion on improving these instructions, please contact r.goldfarb@ieee.org.

II. PROCEDURE FOR PAPER SUBMISSION

A. ScholarOne® Manuscripts

Authors of regular and conference-related papers should prepare their papers for review using Microsoft *Word* and this template or LaTeX and the files contained in IEEEtran.zip. If your paper is submitted in conjunction with a conference, please observe any page limits specified by the conference. **Do not change the font sizes or line spacing to squeeze more text into a limited number of pages. Leave some white space around your figures.** Conference-related papers follow the same review procedures as regular papers.

Regular and conference-related papers must be submitted electronically to IEEE’s on-line manuscript submission and peer-review system, *ScholarOne® Manuscripts*. Regular papers should be submitted at mc.manuscriptcentral.com/transmag-ieee; for conference-related papers, go to mc.manuscriptcentral.com/magconf-ieee. You should first check if you have an existing account. If there is none, please create a new account. (Your log-in information is the same on both sites.) After logging in, go to your Author Center and

click on the link, “Click here to submit a new manuscript.”

Along with other information, you will be asked to select the type of submission from a pull-down list. If you are submitting a conference-related paper, choose the type appropriate for your conference. You will also be asked to select the subject of your article. Additionally, conference authors are asked for the conference paper number. Using the format specific to your conference, enter this number in the text box and also in the header at the top of this document.

There are 7 stages (screens) to the submission process; you must complete all 7 for a complete submission. At the end of each stage you must click “Save and Continue”; simply uploading files is not sufficient. After step 7 you should see a confirmation that the submission is complete. You should also receive an e-mail confirmation. For inquiries regarding the submission of your paper on *ScholarOne® Manuscripts*, please contact oprs-support@ieee.org or call +1 732 465 5861.

ScholarOne® Manuscripts will accept files for review in the following formats: DOC, DOCX, RTF, PS, or PDF. PDF is preferred at the review stage. If you used LaTeX to prepare your document, you must generate a PDF or PS file to upload to *ScholarOne® Manuscripts*. Whatever format you upload, your figures should be embedded in the file, usually at the end.

You will be asked to file an electronic copyright form during the submission process. (Authors are responsible for obtaining any security clearances.)

B. Final Submission

After your paper is accepted, you will be asked to upload final files to *ScholarOne® Manuscripts*. These will include your DOC, DOCX, RTF, or LaTeX document *source* file with embedded figures; an *additional* PS or PDF file; and *separate*, individual figure files. These individual files may be in any of the following formats: TIF (preferred), PDF (preferred), JPG, GIF, EPS, DOC or DOCX (Microsoft *Word*, especially good for tables), or PPT (Microsoft *PowerPoint*, commonly used to make figures). If you own Adobe *Acrobat*, please convert your DOC or DOCX tables and PPT figures to PDF (or click on “Create Adobe PDF Online” at www.adobe.com). Figure and table files should be named following this convention: FIG1.TIF, FIG2.PPT, FIG3.PDF, etc. See more about figure preparation in Section III below.

Also upload a file with complete contact information for all authors. Include full mailing addresses, telephone numbers, fax numbers, and e-mail addresses. Designate the author who submitted the manuscript on *ScholarOne® Manuscripts* as the “corresponding author.” This is the only author to whom proofs of the paper will be sent. You will have the option to designate your article as “open access” in perpetuity if you agree to pay the IEEE open access fee.

C. Publication

About 1 week after your final files are submitted, your paper will appear in preprint form on IEEE Xplore® (ieeexplore.ieee.org/xpl/mostRecentIssue.jsp?punumber=20) under “Early Access,” which will represent official publication.

PDF page proofs will be sent by e-mail to the corresponding author in 6 to 8 weeks. After you approve page proofs, the final version of your article will be published on Xplore®.

Conference-related papers will all be published in a single issue of IEEE TRANSACTIONS ON MAGNETICS devoted to the conference. If you return page proofs late, your paper will appear in a later issue, identified as a conference-related paper.

III. ADVANCED INFORMATION ON CREATION OF ELECTRONIC IMAGE FILES

Most authors will be able to prepare images in one of the allowed formats listed above. This section provides optional, additional information on preparing PS, EPS, and TIFF files. No matter how you convert your images, it is a good idea to print the files to make sure nothing was lost in the process.

For more information on graphics files, please go to www.ieee.org/publications_standards/publications/authors/authors_journals.html and click on the link “Using Microsoft Products or PDFs to Submit Graphics.”

A. IEEE Graphics Checker

Graphics Checker is part of the IEEE’s “Author Digital Toolbox,” a collection of tools for authors at www.ieee.org/publications_standards/publications/authors/authors_journals.html. The direct link for *Graphics Checker* is graphicsqc.ieee.org. You can upload image files in batches of up to 10 to be analyzed and compared to IEEE’s requirements for metadata, file size, file type, file naming, resolution parameters, and color format. You will receive a detailed report on the usability of each image analyzed. The report will include an explanation of any error found, along with, when possible, application-specific tips on how to fix the image. (You may ignore warnings that the author’s name is not part of the file name.) For more information, contact the IEEE Graphics Help Desk at graphics@ieee.org. You will receive an e-mail response and sometimes a request for a sample graphic for IEEE to check.

B. Scanning Images to PS and EPS

If you have a scanner, a quick way to prepare figure files is to print your figures on paper exactly as you want them to appear, scan them, and then save them to a file in PostScript (PS) or Encapsulated PostScript (EPS) formats. Use a separate file for each image. File names should be of the form FIG1.PS or FIG2.EPS.

C. Scanning Images to TIFF

Using a scanner as above, you may save the images in TIFF format. The following specifications are the minimum requirements for TIFF images; you may use higher resolution. As a rule, if your image file size is below 500 kB, your TIFF image probably does not have enough resolution.

High-contrast line figures and tables should be prepared with at least 600 dpi resolution and saved with no compression, 1 bit per pixel (monochrome), with file names of the form FIG3.TIF. To obtain a 3.45 inch figure (one column width) at 600 dpi, the figure requires a horizontal size of 2070

pixels.

Photographs and grayscale figures should be prepared with at least 220 dpi resolution and saved with no compression, 8 bits per pixel (grayscale). To obtain a 3.45 inch figure (one column width) at 220 dpi, the figure should have a horizontal size of 759 pixels.

Color figures should be prepared with at least 400 dpi resolution and saved with no compression, 8 bits per pixel (palette or 256 color). To obtain a 3.45 inch figure (one column width) at 400 dpi, the figure should have a horizontal size of 1380 pixels.

D. Printing images to PS Files

You may create PostScript figures by “printing” them to files. First, download a PostScript printer driver from www.adobe.com/support/downloads/product.jsp?product=pdrv&platform=win (Windows) or www.adobe.com/support/downloads/product.jsp?product=44&platform=Macintosh (Macintosh) and also install the “PPD Files: Adobe” printer definition. In *Word*, paste your figure into a new document. Print to a file using the PostScript printer driver. File names should be of the form FIG5.PS. Use “Open Type” fonts when creating your figures, if possible: Times Roman, Helvetica, Helvetica Narrow, Courier, Symbol, Palatino, Avant Garde, Bookman, Zapf Chancery, Zapf Dingbats, and New Century Schoolbook.

E. Converting PDF to TIFF

Experienced computer users can convert figures and tables from their original format to TIFF. Some useful image converters are Adobe *Photoshop*, Corel *Draw*, Microsoft *Photo Editor* (part of Office 97 through Office XP), *Picture Manager* (Office 2003, 2007, 2010), and *Photo Gallery* (Office 2013). A free, versatile program for image manipulation and format conversion is GIMP, available from www.gimp.org.

From Microsoft Office applications, such as *PowerPoint*, you may print or save as PDF. You may then convert a figure in the PDF file to TIFF with Adobe *Acrobat* or *Reader*: View > Zoom to a large magnification (e.g., 1600%). Use the Snapshot Tool to select the figure and copy it to the Windows clipboard. Open Microsoft *Photo Editor*, Edit > Paste as New Image, crop, and adjust resolution as above. (If using *Picture Manager*, use Picture > Crop, Picture > Resize, File > Export.)

Note that the obvious way to convert *PowerPoint* PPT to TIFF (File > Save As > Save as type TIFF) gives poor results.

Alternatively, you may open the PDF in *Photoshop* or GIMP. Set the resolution to open at 1200 dpi. In GIMP, use “Export As” and save in TIFF format with no compression.

F. Saving Files in TIFF

Most graphing programs allow you to save graphs in TIFF; however, you often have no control over compression or number of bits per pixel. You should open these image files in a program such as Microsoft *Photo Editor* and re-save them using no compression, either 1 or 8 bits, and either 600 or 220 dpi resolution (File > Properties; Image > Resize). See Section III.C for an explanation of number of bits and resolution.

G. Using Print Screen

If your graphing program cannot export to TIFF, you can use the Print Screen function. Set your monitor to its highest resolution. Adjust the magnification so that you can view the entire image on the screen. (In *PowerPoint*, you may use Slide Show to get a full-screen image.) Move the cursor so it is out of the way. Press “Print Screen” on your keyboard; this copies the screen image to the Windows clipboard. Open Microsoft *Photo Editor* and click Edit > Paste as New Image. Crop the image (click Select button; select the part you want, then Image > Crop). Adjust the properties of the image (File > Properties) to get a width of 3.45 inches. Save the file (File > Save As) in TIFF with no compression (click “More” button). Similar functionality is available in GIMP and *Photoshop*.

IV. UNITS

Use either SI (MKS) or CGS as primary units. (SI units are strongly encouraged.) English units may be used as secondary units (in parentheses). This applies to papers in data storage. For example, write “15 Gbit/cm² (100 Gbit/in²).” An exception is when English units are used as identifiers in trade, such as “3½ in disk drive.” Avoid combining SI and CGS units, such as current in amperes and magnetic field in oersteds. This often leads to confusion because equations do not balance dimensionally. If you must use mixed units, clearly state the units for each quantity in an equation.

The SI unit for magnetic field strength H is A/m. However, if you wish to use units of T, either refer to magnetic flux density B or magnetic field strength symbolized as $\mu_0 H$. Use the center dot to separate compound units, e.g., “A·m².”

V. HELPFUL HINTS

A. Editing Service

IEEE has partnered with SPi Publisher Services to offer pre-submission professional editing services to IEEE authors. SPi copyedits and typesets more than 1 million pages per year for over 600 journals. Authors who would like assistance with English grammar and usage prior to submitting their manuscripts for review or during the review process can go to www.prof-editing.com/ieee to submit a manuscript for copyediting. A link is provided on the Manuscript Central Web site. SPi copyeditors will edit for grammar, usage, organization, and clarity. Authors can use the service, at their own expense, as often as desired. Cost estimates are available on-line, typically about \$100 for a four-page article. Edited manuscripts are generally returned to the authors within two weeks of submission.

B. Figures and Tables

Because IEEE will do the final formatting of your paper, you do not need to position figures and tables at the tops and bottoms of columns. In fact, all figures, figure captions, and tables can be at the end of the paper. Please mark in the text where the figures and tables are supposed to appear. Large figures and tables may span both columns. Place figure captions below the figures; place table captions above the

tables. If your figure has two parts, for example, include the labels “(a)” and “(b)” as part of the artwork. Please verify that figures and tables that you mention in the text actually exist. Please do not include captions as part of the figures. Do not put captions in “text boxes” linked to the figures. Do not put borders around the outside of your figures. Use the abbreviation “Fig.” even at the beginning of a sentence. Do not abbreviate “Table.” Tables are numbered with Arabic numerals.

TABLE 1 HERE (Note white space above and below.)

C. Color Figures

There is no charge for color figures for the *electronic* (IEEE Xplore®) version of a paper. However, if any figures must be in color for the *print* version of the paper, the cost is about \$1300, depending on the number of figures and their placement. You will be billed directly by IEEE. When you send the final version of their paper, you should indicate very clearly if you want color in the *print* version. In the absence of such instructions, color will be used only for the *electronic* version. In that case, please be certain that the black-and-white *print* version is understandable without the color information. If you want reprints of your color article, the reprint order should be submitted promptly. There is an additional charge of \$81 per 100 for color reprints.

Figure axis labels are often a source of confusion. Use words rather than symbols. As an example, write the quantity “Magnetization,” or “Magnetization, M ,” not just “ M .” However, if there is not enough room on the axis to specify the quantity, write just the symbol “ M ,” but define it in the figure caption.

IEEE allows two ways to designate units in graphs and tables: (1) Put units in parentheses. As in Fig. 1, for example, write “Magnetization (A/m)” or “Magnetization, M (A·m⁻¹)” (but not just “A/m”). (2) Label axes with a ratio of symbols and units. For example, write “Magnetization, $M/(A·m^{-1})$ ” or “Temperature, T/K ” (but not “Temperature/K”).

Multipliers can be especially confusing. Write “Magnetization (kA/m)” or “Magnetization (10³ A/m).” Do not write “Magnetization (A/m) × 1000” because the reader would not know whether the top axis label in Fig. 1 meant 16000 A/m or 0.016 A/m. Figure labels should be legible, approximately 8 to 10 point type when reduced to journal column width.

FIG. 1 HERE (Note white space above and below.)

D. References

Number citations consecutively in square brackets [1]. The sentence punctuation follows the brackets [2]. Multiple

references [2], [3] are each numbered with separate brackets [1]-[3]. When citing a section in a book, please give the relevant page numbers [2]. In sentences, refer simply to the reference number, as in [3]. Do not use “Ref. [3]” or “reference [3]” except at the beginning of a sentence: “Reference [3] shows” Unfortunately the IEEE document translator cannot handle automatic endnotes in *Word*; therefore, type the reference list at the end of the paper using the “References” style.

Number footnotes separately in superscripts (Insert > Footnote).¹ Place the actual footnote at the bottom of the column in which it is cited; do not put footnotes in the reference list (endnotes). Use letters for table footnotes (see Table I).

Note that IEEE referencing style is quite different from that used by most physics journals. Give all authors’ names; do not use “*et al.*” unless there are six authors or more. Use a space after authors’ initials. Papers that have not been published should be cited as “unpublished” [4]. Papers that have been submitted for publication should be cited as “submitted for publication” [5]. (Since the paper may not be accepted, it is best to not specify the journal.) Papers that have been accepted for publication but not yet assigned to an issue should be cited as “to be published” [6]. Please give affiliations and addresses for private communications [7].

Capitalize only the first word in a paper title, except for proper nouns and element symbols. If you are preparing a conference-related paper and are short of space, you may omit paper titles. However, paper titles are helpful to your readers and are strongly recommended. For papers published in translation journals, please give the English citation first, followed by the original foreign-language citation [8].

E. Abbreviations and Acronyms

Define abbreviations and acronyms the first time they are used in the text, even after they have already been defined in the abstract. Abbreviations such as IEEE, SI, ac, and dc do not have to be defined. Abbreviations that incorporate periods should not have spaces: write “C.N.R.S.,” not “C. N. R. S.” Do not use abbreviations in the title unless they are unavoidable (for example, “IEEE” in the title of this article).

F. Equations

If you are using *Word*, use either the Microsoft Equation Editor or the *MathType* add-on (www.dessci.com/en/products/mathtype) for equations in your paper (Insert > Equation). Fit the equation into one column by breaking it as you wish it to appear when typeset. You may find it convenient to create a new “equation” for each section of the equation.

Number equations consecutively with equation numbers in parentheses in the vicinity of the equation, as in (1). To make your equations more compact, you may use the solidus (/), the exp function, or appropriate exponents. Use parentheses to avoid ambiguities in denominators. Punctuate equations when

¹It is recommended that footnotes be avoided (except for the unnumbered footnote with the receipt date on the first page). Instead, try to integrate the footnote information into the text.

they are part of a sentence, as in

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

Be sure that the symbols in your equation have been defined before the equation appears or immediately following. Italicize symbols (T might refer to temperature, but T is the unit tesla). Refer to “(1),” not “Eq. (1)” or “equation (1),” except at the beginning of a sentence: “Equation (1) is”

Please confine equations to one column width and break equations at appropriate algebraic symbols.

G. Other Recommendations

Use one space after periods and colons. Hyphenate complex modifiers: “zero-field-cooled magnetization.” However, do not hyphenate numbers and units: “10 nm thick film,” not “10-nm-thick film.” Avoid dangling participles, such as, “Using (1), the potential was calculated.” [It is not clear who or what used (1).] Write instead, “The potential was calculated by using (1),” or “Using (1), we calculated the potential.”

Use a zero before decimal points: “0.25,” not “.25.” Use “cm³,” not “cc.” Indicate sample dimensions as “0.1 cm × 0.2 cm,” not “0.1 × 0.2 cm².” The abbreviation for “seconds” is “s,” not “sec.” Do not mix complete spellings and abbreviations of units: use “Wb/m²” or “webers per square meter,” not “webers/m².” 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 the parentheses.) In American English, periods and commas are 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 (use the singular if you are the only author) and use the active voice (“I observed that ...” or “We observed that ...” instead of “It was observed that ...”). Better still, omit statements of observation and just report what you measured: “The susceptibility decreased with temperature” instead of “We observed that the susceptibility decreased with temperature.” Similarly, avoid “We found that”

Remember to check spelling. If you are not fluent in English, please get a colleague to proofread your paper.

VI. SOME COMMON MISTAKES

The word “data” is plural, not singular. The subscript for the permeability of vacuum μ_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.” Use the word “micrometer” instead of “micron.” 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.”

Because “times” refers to multiplication, do not use the form “ n times smaller”; instead, write “ $1/n$ times as large” or similar. For example, instead of “10 times smaller,” write “one tenth the size” or “0.1 times as large.” Do not use “times more”; instead, write “times as much.” For example, “2 times more” could be interpreted as “3 times as much.”

When compositions are not specified, separate chemical symbols by hyphens; for example, “NiMn” indicates the intermetallic compound Ni_{0.5}Mn_{0.5} whereas “Ni-Mn” indicates an alloy of some composition Ni_xMn_{1-x}.

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,” 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 Latin abbreviation “et al.” The abbreviation “i.e.” means “that is,” and the abbreviation “e.g.” means “for example.”

An excellent style manual and source of information for science writers is [9]. A general *IEEE Style Manual* is available at www.ieee.org/publications_standards/publications/authors/authors_journals.html. (The style for IEEE TRANSACTIONS ON MAGNETICS differs in some respects.)

VII. EDITORIAL POLICY

Submission of a manuscript is not required for participation in a conference. Do not submit a reworked version of a paper you have submitted or published elsewhere, including conference papers. Do not submit “preliminary” data or results. The submitting author is responsible for obtaining agreement of all coauthors and any consent required from sponsors before submitting a paper. IEEE TRANSACTIONS ON MAGNETICS strongly discourages courtesy authorship. It is the obligation of the authors to cite relevant prior work. If you copy sentences, paragraphs, figures, or tables from another paper, even if it is your own paper, you must cite that paper at the corresponding point in your manuscript. IEEE’s plagiarism (and excessive duplication) guidelines are described in detail at www.ieee.org/publications_standards/publications/rights.

The TRANSACTIONS does not publish conference records or proceedings. The TRANSACTIONS does publish papers related to conferences on basic and applied magnetism that have been recommended for publication on the basis of peer review. As a matter of convenience and service to the technical community, these topical papers are collected and published in one issue of the TRANSACTIONS. Conference-related papers published in the TRANSACTIONS have the same peer-review requirements

and the same status as regular papers.

Occasionally authors wish to submit a regular manuscript based on a previously published paper that appeared in a conference proceedings. Such submissions must contain a significant amount of new content, must cite the prior conference-proceedings paper, and must state, in the text, what is new in the current manuscript.

At least two favorable reviews are required for a paper to be accepted for publication. In the event of an unfavorable review, it is at the discretion of the editor whether to seek additional reviews. The editors additionally make a determination of suitability, which is different from a judgment of whether a paper is sound or flawed. The editors consider whether a paper contributes significant new material, is within the scope of the journal, or is more suited to another journal.

For conference-related papers, the decision to accept or reject a paper is made by the conference editors and publications committee based on peer review and the scope of the conference. Undecipherable English is a valid reason for rejection. Authors of rejected papers may revise and resubmit them to the TRANSACTIONS as regular papers, whereupon they will be reviewed by two new referees.

VIII. PUBLICATION PRINCIPLES

IEEE TRANSACTIONS ON MAGNETICS is a peer-reviewed, archival journal in science and technology related to the basic physics and engineering of magnetism, magnetic materials, applied magnetics, magnetic devices, and magnetic data storage. The TRANSACTIONS publishes scholarly articles of archival value as well as tutorial expositions and critical reviews of classical subjects and topics of current interest.

Authors should consider the following points:

1. Technical papers submitted for publication must advance the state of knowledge and must cite relevant prior work.

2. The length of a submitted paper should be commensurate with the importance, or appropriate to the complexity, of the work. For example, an obvious extension of previously published work might not be appropriate for publication or might be adequately treated in just a few pages.

3. Authors must convince both peer reviewers and the editors of the scientific and technical merit of a paper; the standards of proof are higher when extraordinary or unexpected results are reported.

4. Because replication is required for scientific progress, papers submitted for publication must provide sufficient information to allow readers to perform similar experiments or calculations and use the reported results. Although not everything need be disclosed, a paper must contain new, useable, and fully described information. For example, a specimen's chemical composition need not be reported if the main purpose of a paper is to introduce a new measurement technique. Authors should expect to be challenged by reviewers if the results are not supported by adequate data and critical details.

5. Papers that describe ongoing work or announce the latest technical achievement, which are suitable for presentation at a

professional conference, may not be appropriate for publication in the TRANSACTIONS.

IX. CONCLUSION

A conclusion section is not required. Although a conclusion may review the main points of the paper, do not replicate the abstract in the conclusion. A conclusion might elaborate on the importance of the work or suggest applications and extensions.

APPENDIX

Appendixes, if needed, appear before the acknowledgment.

ACKNOWLEDGMENT

The preferred spelling of the word "acknowledgment" in American English is without an "e" after the "g." Use the singular heading even if you have many acknowledgments. Avoid expressions such as "One of us (S.B.A.) would like to thank" Instead, write "S.B.A. thanks" This work was supported in part by the U.S. Department of Commerce under Grant BS123456 (sponsor and financial support acknowledgment goes here).

REFERENCES

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The second paragraph uses the pronoun of the person (he or she) and not the author's last name. It lists military and work experience, including summer and fellowship jobs. Job titles are capitalized. The current job must have a location; previous positions may be listed without one. Information concerning previous publications may be included. Try not to list more than three books or published articles. The format for listing publishers of a book within the biography is: title of book (city, state: publisher name, year) similar to a reference. Current and previous research interests ends the paragraph.

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TABLE I
UNITS FOR MAGNETIC PROPERTIES (SHORT TITLE HERE)

Symbol	Quantity	Conversion from Gaussian and CGS EMU to SI ^a
Φ	magnetic flux	1 Mx $\rightarrow 10^{-8}$ Wb = 10^{-8} V·s
B	magnetic flux density, magnetic induction	1 G $\rightarrow 10^{-4}$ T = 10^{-4} Wb/m ²
H	magnetic field strength	1 Oe $\rightarrow 10^3/(4\pi)$ A/m
m	magnetic moment	1 erg/G = 1 emu $\rightarrow 10^{-3}$ A·m ² = 10^{-3} J/T
M	magnetization	1 erg/(G·cm ³) = 1 emu/cm ³ $\rightarrow 10^3$ A/m
$4\pi M$	magnetization	1 G $\rightarrow 10^3/(4\pi)$ A/m
σ	specific magnetization	1 erg/(G·g) = 1 emu/g $\rightarrow 1$ A·m ² /kg
j	magnetic dipole moment	1 erg/G = 1 emu $\rightarrow 4\pi \times 10^{-10}$ Wb·m
J	magnetic polarization	1 erg/(G·cm ³) = 1 emu/cm ³ $\rightarrow 4\pi \times 10^{-4}$ T
χ, κ	susceptibility	1 $\rightarrow 4\pi$
χ_p	mass susceptibility	1 cm ³ /g $\rightarrow 4\pi \times 10^{-3}$ m ³ /kg
μ	permeability	1 $\rightarrow 4\pi \times 10^{-7}$ H/m = $4\pi \times 10^{-7}$ Wb/(A·m)
μ_r	relative permeability	$\mu \rightarrow \mu_r$
w, W	energy density	1 erg/cm ³ $\rightarrow 10^{-1}$ J/m ³
N, D	demagnetizing factor	1 $\rightarrow 1/(4\pi)$

No vertical lines in table. Statements that serve as captions for the entire table do not need footnote letters. A longer description of the table would go here.

^aGaussian units are the same as cgs emu for magnetostatics; Mx = maxwell, G = gauss, Oe = oersted; Wb = weber, V = volt, s = second, T = tesla, m = meter, A = ampere, J = joule, kg = kilogram, H = henry.

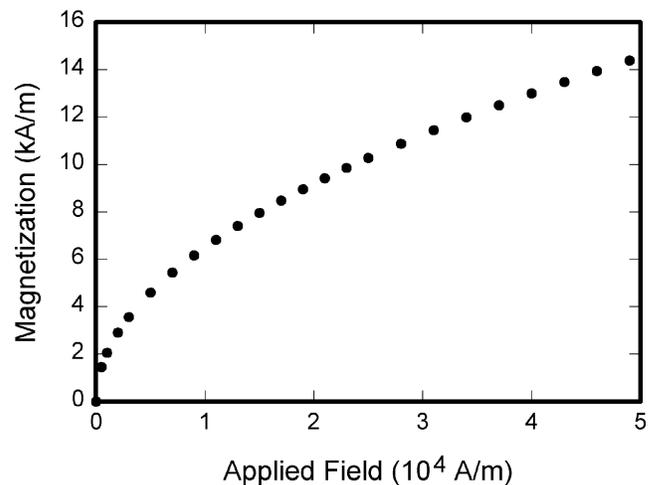


Fig. 1. Magnetization as a function of applied field. Note that “Fig.” is abbreviated. There is a period after the figure number, followed by two spaces. It is good practice to explain the significance of the figure in the caption.