# Title: No More Than Four Lines

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### SECTIONS

Sections following the introduction should present your results and findings. The body of the paper should be approximately 6,000 words and maximum of 6-pages. Articles exceeding 6 pages during author proof will be charged at US\$ 250 per page for extra pages beyond first allowed 6 pages. Similarly, the first allowed pages for column articles is 3 pages, and for news items 2 pages. The manuscript should evolve so that each sentence, equation, figure, and table flow smoothly and logically from whatever precedes it. Relevant work by others, as well as relevant products from

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Headings may be numbered or unnumbered ("1 Introduction" and "1.2 Numbered level 2 head"), with no ending punctuation. As demonstrated in this document, the initial paragraph after a heading is not indented.

# MAGAZINE STYLE

Use American English when writing your paper. The serial comma should be used ("a, b, and c" not "a, b and c"). In American English, periods and commas are within quotation marks, like "this period." Other punctuation is "outside"! The use of technical jargon, slang, and vague or informal English should be avoided. Generic technical terms should instead be used.

#### Acronyms and Abbreviations

All acronyms should be defined at first mention in the abstract and in the main text. Define in figures, tables, and footnotes only if not defined in the discussion of the figure/table. Acronyms consist of capital letters (except where salted with lowercase), but the terms they represent need not be given initial caps unless a proper name is involved ("central processing unit" [CPU] but "Fourier transform" [FT]). Use of "e.g." and "i.e." okay, but refrain from using "etc." It is preferable to use these abbreviations only in parentheses (e.g., like this).

Abbreviate units of time (s, min, hr, day, mo, yr) only in virgule constructions (10  $\mu$ g/hr) and in artwork; otherwise, spell out, e.g., 10 days, 3 months, 25 minutes. Units of measure (Kb, MB, kWh, etc.) should always be abbreviated when used with a numeral. If used alone, spell out ("16 MB of RAM" but "these values are measured in micrometers").

#### Numbers

Spell out numerals that have no unit of measure or time (one, two, ... ten), but always use numerals with units of time and measure. Some examples are as follows: 11 through 999; 1,000; 10,000; twentieth century; twofold, tenfold, 20-fold; 2 times; 0.2 cm; p = 0.001; 25%; 10% to 25%.

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Scalar variables and physical constants should be italicized, and a bold (non-italics) font should be used for **vectors** and **matrices**. Do not italicize subscripts unless they are variables.

Equations should be either display (with a number in parentheses) or inline.

Display equations should be flush left and numbered consecutively, with equation numbers in parentheses and flush right.

Be sure the symbols in your equation have been defined before the equation appears or immediately following. Please refer to "Equation (1)," not "Eq. (1)" or "equation (1)."

Punctuate display equations when they are part of the sentence preceding it, as in  $a^2 + b^2 = c^2$ . In addition, if the text following the equation flows logically as a part of the display equation,

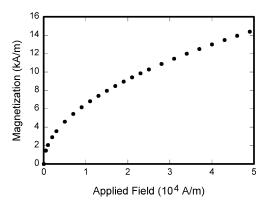
$$A = \pi r^2. \tag{1}$$

use ending punctuation (comma) after the display equation.

### LISTS

Avoid using lists. Instead, use full sentences and flowing paragraphs. If you absolutely must use a list, use them rarely and keep them short:

- *Style for bulleted lists*—This is the style that should be used for bulleted lists.
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**Figure 1.** Note that "Figure" is spelled out. There is a period after the figure number, followed by one space. It is good practice to briefly explain the significance of the figure in the caption. (Used, with permission, from [4].)

Table 1. Units for magnetic properties.

Symbol	Quantity	Conversion from
		Gaussian and CGS
		EMU to SI <sup>a</sup>
Φ	Magnetic flux	$1 \text{ Mx} \rightarrow 10^{-8} \text{ Wb}$
		$= 10^{-8} \text{ V} \cdot \text{s}$
B	Magnetic flux	$1 \text{ G} \rightarrow 10^{-4} \text{ T}$
	density, magnetic	$= 10^{-4} \text{ Wb/m}^2$
	induction	
H	Magnetic field	$1 \text{ Oe} \rightarrow 10^{-3}/(4\pi)$
	strength	A/m
m	Magnetic moment	1  erg/G = 1  emu
	_	$\rightarrow 10^{-3} \text{ A}$ ·
		$m^2 = 10^{-3} J/T$
M	Magnetization	$1 \operatorname{erg}/(G \cdot cm^3) = 1$
		$emu/cm^3 \rightarrow 10^{-3}$
		A/m
$4\pi M$	Magnetization	$1 \text{ G} \rightarrow 10^{-3}/(4\pi)$
		A/m
$\sigma$	Specific	$1 \operatorname{erg}/(\mathbf{G} \cdot \mathbf{g}) = 1$
	magnetization	$emu/g \rightarrow 1 A \cdot m^2/kg$
j	Magnetic dipole	1  erg/G = 1  emu
	moment	$\rightarrow 4\pi \times 10^{-10} \text{ Wb}$ ·
		m
J	Magnetic	$1 \operatorname{erg}/(\mathbf{G} \cdot \mathbf{cm}^3) = 1$
	polarization	emu/cm <sup>3</sup>
		$\rightarrow 4\pi \times 10^{-4} \mathrm{T}$
$\chi,\kappa$	Susceptibility	$1 \rightarrow 4\pi$
$\chi_{ ho}$	Mass	$1 \text{ cm}^3/\text{g} \to 4\pi \times 10^{-3}$
	susceptibility	m <sup>3</sup> /kg
$\mu$	Permeability	$1 \rightarrow 4\pi \times 10^{-7}$ H/m
		$=4\pi \times 10^{-7}$ Wb/(A $\cdot$
	DIC	m)
$\mu_r$	Relative	$\mu \rightarrow \mu_r$
117	permeability	$1 \dots 1 \dots 3 \dots 10^{-1}$
w, W	Energy density	$1 \text{ erg/cm}^3 \rightarrow 10^{-1}$
ND	Democraticies	$J/m^3$
N, D	Demagnetizing	$1 \to 1/(4\pi)$
	factor	

Vertical lines are optional in tables. Statements that serve as captions for the entire table do not need footnote letters. <sup>a</sup>Gaussian units are the same as cg 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.

# GRAPHICAL ABSTRACTS

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#### In-Text Callouts for Figures and Tables

Figures and tables must be cited in the running text in consecutive order. At first mention, the citation should be boldface (Figure 1); subsequent mentions should be Roman type (see Figure 1 and Table 1). Previously published figures or tables require permission to reprint. Please obtain permission. Then, add the following text to the figure/table caption: "From [reference no.], with permission," or "Adapted from [reference no.], with permission." *Carefully* explain each figure in the text. Each manuscript should be limited to four figures.

# END SECTIONS

#### Appendices

If multiple appendices are required, they should labeled "Appendix A," "Appendix B," etc. They appear before the "Acknowledgment" or the "References" section.

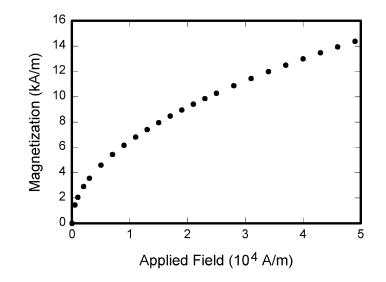
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**Figure 2.** Note that "Figure" is spelled out. There is a period after the figure number, followed by one space. It is good practice to briefly explain the significance of the figure in the caption. (Used, with permission, from [4].)

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## CONCLUSION

The manuscript should include a conclusion. In this section, summarize what was described in your paper. Future directions may also be included in this section. Authors are strongly encouraged not to reference multiple figures or tables in the conclusion; these should be referenced in the body of the paper.

#### ACKNOWLEDGMENTS

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# REFERENCES

- G. M. Amdahl, G. A. Blaauw, and F. P. Brooks, "Architecture of the IBM System/360," *IBM J. Res. & Dev.*, vol. 8, no. 2, pp. 87–101, 1964, doi: 10.1147/rd.82.0087. (journal)
- IBM Corporation, IBM Knowledge Center IBM Secure Service Container (Secure Service Container).
   [Online]. Available: https://www.ibm.com/support/ knowledgecenter/en/HW11R/com.ibm.hwmca.kc\_se.doc/ introductiontotheconsole/wn2131zaci.html (URL)
- J. Williams, "Narrow-band analyzer," PhD dissertation, Dept. of Electrical Eng., Harvard Univ., Cambridge, MA: 1993. (Thesis or dissertation)
- J. M. P. Martinez, R. B. Llavori, M. J. A. Cabo, et al., "Integrating data warehouses with web data: A survey," *IEEE Trans. Knowledge and Data Eng.*, preprint, Dec. 21, 2007, doi: 10.1109/TKDE.2007.190746. (PrePrint)

- W.-K. Chen, *Linear Networks and Systems*, Belmont, CA: Wadsworth, pp. 123–135, 1993. (book)
- S. P. Bingulac, "On the compatibility of adaptive controllers," *Proc. Fourth Ann. Allerton Conf. Circuits and Systems Theory*, pp. 8–16, 1994, doi: number. (conference proceedings)
- K. Elissa, "An overview of decision theory," unpublished. (Unpublished manuscript)
- R. Nicole, "The last word on decision theory," *J. Computer Vision*, submitted for publication. (Pending publication)
- C. J. Smith and J. S. Smith, Rocky Mountain Research Laboratories, Boulder, CO, personal communication, 1992. (Personal communication)

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