

PHYSICAL REVIEW LETTERS
INFORMATION FOR CONTRIBUTORS

(Revised January 2009)

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Papers should be written in scientific **English**, in a style consistent with that of the journal. The total length of a Letter should not exceed 4 journal pages; a Comment, 1 page. (Guidelines for estimating the length of manuscripts are available on the Author Forms subpage at <http://forms.aps.org/author.html> and at the end of some issues of the journal.) Submission is a representation that the work is not now being considered for publication elsewhere. Proper text reference must be made to portions previously published

or scheduled for publication, including conference proceedings. See “Prior Disclosure,” Phys. Rev. Lett. **52**, 2101 (1984).

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Manuscripts sent by **conventional mail** should be submitted to the Editors, Physical Review Letters, 1 Research Road, Ridge, NY 11961-2701. The manuscript must be printed (double spaced) on one side of the paper only.

Normally, manuscripts and figures are *not returned* to authors. Authors should indicate (preferably on initial submittal) if they want the manuscript and/or figures returned when correspondence is sent during the editorial process, and/or after a final decision has been made.

When a manuscript is **resubmitted**, please include a summary of changes made and a brief response to all recommendations and criticisms. The interactive resubmission forms available on our Web server may be used for electronic-mail, Web-upload, and hard-copy transmission of modified manuscripts and figures. These forms should also be used when a manuscript previously submitted to one APS journal is resubmitted to another. When **resubmitting electronically**, send the complete file for the text if there have been any changes. Please refer to the online documentation for more detailed instructions. If the resubmission is by conventional mail, send one copy of the revised manuscript (with figures). For any resubmission, please state whether or not the figures have been modified, and supply new electronic figures or scanner-reproducible figures if there have been such changes. It is only necessary to resend the “original” figures if the previous versions are no longer valid. Please update any other information (e.g., address and communication information) that has changed or will change since initial submission.

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The following are general guidelines for preparation of a conventional manuscript or a compuscript. In addition, memos regarding production requirements appear at the end of some issues of the journal. For **general format and style** consult recent issues of this journal and the *Physical Review Style and Notation Guide* at <http://authors.aps.org/STYLE/>. Additional style guidelines can be found in the Fourth Edition of the *AIP Style Manual*, available at <http://www.aip.org/pubservs/style.html>.

A **manuscript**, comprising all material which is to be set in type, must be typewritten (except possibly for mathematical expressions and Greek letters; see below), double spaced (3 lines per inch, at least 6 mm of white space between lines) in type size such that there are ≤ 90 characters/6 in., on one side only of good quality, white, approximately 8.5×11-in. (or A4) paper, with margins of at least 1 in. along four edges. A clear, sharp, nonerasable, black-on-white reproduction on hard-surfaced paper is acceptable as the “original.” Number all pages (including the title page). Include copies of any figures at the end of the manuscript.

Mathematical expressions should be typed, or neatly written in ink. The prime requisite is that the copy shall be clear to the production keyboarder, who is neither a physicist nor a mathematician. Unusual or ambiguous symbols (see table on page 21 of the Style Manual) should be identified by marginal notes at first appearance and subsequently when confusion might arise; for nonalphabetic symbols, give the number found on pages 44 and 45 of the Style Manual. Mark superscripts with an inverted caret below, and subscripts with a caret above, if necessary. Three-vectors and dyadics are set in boldface type (mark with a black-pencil, wiggly underline).

Editorial marking by authors, except for the resolution of ambiguities as discussed above, is rarely of sufficient value to warrant the effort.

The author must carefully **proofread** the paper to eliminate grammatical errors, misspellings, and omission of symbols. The text should be directed at a **general readership**, not specialists. Avoid acronyms and jargon, even if they seem of common usage. If unavoidable, define them in the text. **Notation** should be unambiguous, concise, and consistent with standard usage. Introduce new terminology or notation only when clearly

needed. Indent all paragraphs. Use the solidus (slash) only to denote division of mathematical quantities, to denote (optionally) an interface between materials [e.g., Ag/Cu(001)], and in “and/or.” Its meaning when used between words is usually imprecise; use the proper conjunction or punctuation.

The **length** of the paper is crucial. Avoid excess white space in figures; unneeded numbering of displayed equations may add length; references which are incomplete may lead to an underestimate of the length; and note that right-adjusted text or text with very nonuniform line length is subject to greater error in its estimated length. Also note that equations in text (undisplayed) must be simple; some equations which are presented in text may need to be displayed in the journal and thus add to the length.

Ideally, figures are planned for reduction to final journal size on the basis of their content and detail. The size of lettering should be chosen with this in mind. If the lettering is drafted too small, full reduction will not be possible; the length will have been underestimated. At final reduction, the size of the smallest capital letters and numerals is to be at least 2 mm.

Ultimately it is the responsibility of the author to provide a paper of the proper length. The Editorial Office attempts to provide some guidance. A quick-count formula is applied to each new paper. The staff makes a more careful estimate of the publication length of those whose quick count exceeds a limit value, and reports the calculation to the author. In a case of excessive length, the paper must be shortened prior to review. In a case of the estimated length being close to the final limit, the author is advised to make the next version shorter. The length restriction applies to all versions of a paper. Upon acceptance of a paper for publication, length is again considered by the staff; the author may be requested to supply the shortened version before production can proceed. The composition of the paper into

journal pages is the final criterion. If the length is still excessive, publication is delayed until satisfactory cuts are obtained.

The **title** should be concise, but informative enough to instruct the nonexpert reader and to facilitate information retrieval. Do not introduce new terminology in titles. There must be an **abstract** (double spaced) of no more than 600 characters, including spaces, which should be self-contained (no footnotes) for use in abstracting journals and databases. Comments and Replies should not include an abstract.

The **names of authors** may be listed in any order in the byline between the title and abstract. If the number of authors exceeds 40, the authors will be listed in the Table of Contents as, e.g., A. Jones *et al.* The author who submits the paper should ensure that all persons listed as authors approve the inclusion of their names, and check that the form of each name is the one normally used by that author.

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Punctuate **mathematical expressions** and displayed equations as part of the sentence. In general, use *single-letter* symbols for mathematical quantities in equations and expressions, possibly with subscript or superscript indices or labels and with

argument(s) in parentheses. There are a few well established multiletter exceptions, such as the trigonometric functions. Avoid complicated superscripts and subscripts. Avoid frequent repetition of a complicated mathematical expression; represent it by some convenient symbol. Use the form $\exp(\cdot)$ in cases of long or complicated arguments. Except for the square root of a simple quantity without superscripts, use fractional exponents instead of the radical sign. Avoid the use of bars over extended expressions. Avoid the use of diacritical marks (tildes, etc.) over groups of symbols, as well as the use of double oversymbols (e.g., a caret over a tilde). Use the solidus (/) or negative exponents for fractions in running text, and in displayed equations when this does not reduce clarity. When the extent of a denominator is ambiguous, use appropriate bracketing to ensure clarity. Give the base of logarithms (e.g., \ln , \log_{10} , \log_2). "Dangling" decimal points should be preceded or followed by zeros or deleted, as appropriate.

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A final **acknowledgments** paragraph may be used to recognize named individuals who contributed scientifically to the specific research of the paper, to cite the funding agencies that provided financial support for the work, and to note the affiliation of institutions in the byline with a larger system. The statement of thanks for help should be simple and may not be a dedication or memorial. References to memberships, positions, titles, and awards are inappropriate, as are dates associated with funding. It is unnecessary to give the exact form, e.g., fellowship, scholarship, program name, in which funding was granted.

Footnotes, both references *and remarks*, must be numbered consecutively in order of citation, and be given in a double-spaced list at the end of the main text. The journal does not use bottom-of-page footnotes. Order a reference cited in a figure or table caption as if cited when the figure or table is *first* mentioned in the text. Cite footnotes in text, captions, or other footnotes in the form "Smith, Doe, and Jones [2]," "recent experiments [1,4-6]," or "see Ref. [8]." The names of all authors of cited papers should normally be given in the references except when the number of authors is very large (say, more than 10). If the length limit is a problem, the name of the first author followed by *et al.* (no comma before *et*) may be used for cited papers with four or more authors.

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J. M. Smith, R. Brown, and C. Green, *Phys. Rev. B* **26**, 1 (1982); *Nucl. Phys.* **A195**, 1 (1982).

J. M. Smith, *Phys. Rev. D* (to be published); R. Brown, *Phys. Rev. B* **26**, 706(E) (1982).

J. M. Smith, *Molecular Dynamics* (Academic, New York, 1980), Vol. 20, p. 20.

R. Brown, in *Charge Density Waves in Solids*, edited by C. Green, Modern Problems in Condensed Matter Sciences Vol. 25 (North-Holland, Amsterdam, 1989).

C. Green, University of Wisconsin, Madison, Report No. MAD/PH/650, 1991.

J. M. Smith *et al.*, in Proceedings of the Topical Meeting on CP Violation, Calcutta, June 1990 (unpublished).

It is important to confirm the accuracy of bibliographic information in references. This has become more important now that the journal is online. Hyperlinks will be programmed to enable readers to “click” on references and jump directly to the material cited. If your reference citations are incorrect or incomplete (e.g., missing author name, or an incorrect volume number or page), the associated hyperlinks may fail, and the usefulness of your paper in the online environment may be diminished. Since at the present time such links work only from the reference section, work cited anywhere in the paper, including in figure and table captions and in “Note(s) added,” should be included in the reference section.

Separate **tables**, numbered in the order in which they are referred to in text, should be used for all but the simplest tabular material. Include them after the reference and footnotes. Each table *must* have a caption (double spaced) that makes the table intelligible without reference to the text. Column headings should be simple and contain all units; symbols should be explained in the caption. Use a single horizontal rule to separate headings and entries. Use horizontally running space to distinguish broad groups among entries, and extra vertically running

space for columnar groups. Vertical rules should not be used. Denote footnotes in a table by superscript lower-case roman letters, and list at the end of the table.

Figures should be planned for the column width (8.6 cm or $3\frac{3}{8}$ in.) of the journal. If the detail shown requires it, 1.5 or 2 columns may be used. A note should be left on or with such figures. *Final-journal-size* originals or prints are preferable to oversized originals. Authors are encouraged to submit all figures electronically, even if the text of the manuscript is not submitted electronically; refer to the online instructions for more details. Figures submitted on paper should be of high quality and suitable for digital scanning, which is done at 600 or 1200 dpi depending on the level of detail; original ink drawings or glossy prints are acceptable. Be advised that the scanner reproduces all imperfections (e.g., correction fluid, tape, smudges, writing on the back of the figure, etc.). All figures must be prepared so that the details can be seen after reproduction. They must have a clear background and unbroken lines with as much black-white contrast as possible. The symbol width and lettering height on the journal page should be at least 2 mm. Avoid small open symbols that tend to fill in, small dots and decimal points, and shading or cross-hatching that is not coarse enough to withstand reproduction. Curves should be smooth; curves and lines should have consistent line widths of sufficient weight [final weight of at least 0.18 mm (0.5 point)]. The resolution of the drawing software and output device should be set as high as possible (preferably 600 dpi or higher).

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In preparing figures, care should be taken to present the scientific results accurately. If images used in any of the figures have been **manipulated**, except for adjustments that affect the picture as a whole (e.g., overall brightness), the modification should be described clearly in the caption or text.

Some figures might be more effective in **color**. The cost of printing illustrations in color, which may be significant, must be borne in full by the respective authors and their institutions.

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