

PHYSICAL REVIEW D INFORMATION FOR CONTRIBUTORS

(Revised July 1998)

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Manuscripts may be **submitted** by a variety of electronic modes (including via e-print servers, direct Web upload, and email), or by conventional mail, but not by fax. Interactive submission forms, available on our Web server, are an integral part of the submission process for the e-print and Web modes, and are strongly recommended for email and conventional-mail submission. These forms aid authors in supplying all the information needed in a structured format which furthers efficient processing; they also provide a location for additional “free form” information. [For authors without Web browsers which support forms, noninteractive versions of the submission forms are available via ftp to aps.org in the /pub/jrnls directory as the sub_prd files (include filename suffix .asc, .tex, or .ps), or by request to the Editorial Office.]

Please specify the author to whom correspondence should be addressed, and give all available communications information for this individual (postal and email addresses, phone and fax numbers), since in various circumstances they may all be useful. Please specify journal and section to which the paper is submitted, and give PACS (Physics and Astronomy Classification Scheme) index categories if possible. (The scheme is available on our Web server, and also via ftp to aps.org as the file pacs_98.asc in the /pub/pacs directory.) If an important subject of your paper cannot be appropriately classified in the PACS scheme, please give an appropriate keyword or phrase, and indicate approximately where in the scheme this topic would be best placed.

A signed APS **copyright-transfer** form should be included with the submission, and will be required before publication. While the transfer of copyright takes effect only upon acceptance of the paper for publication in an APS journal, supplying the form initially can prevent unnecessary delays. The form appears at the end of the 9 March 1998 issue of *Physical Review Letters* and is available from the Editorial Office, on the World Wide Web via the URL <http://publish.aps.org/>

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Electronic submissions may be formatted in REVTeX (preferred), LaTeX, Harvmac, or Plain TeX. The file must be in ASCII containing no control codes, with line lengths of 80 characters or less. All textual material of the paper (including tables, captions, etc.) should be in electronic form, as a single file. The file should produce double-spaced output. Properly prepared electronic submissions are **exempt from publication charges**, whether or not they also qualify for the compuscript-conversion production program. See paragraph beginning with “compuscripts” (below).

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Figures for an electronic submission must be received in at least review-quality form before editorial processing can begin. Web upload or electronic-mail transmission (one figure per file) of PostScript-formatted figures will normally meet this need. For color or continuous-tone PostScript figures, hard-copy originals are also required. The originals are needed to ensure that the reproductions created from the electronic figure files are satisfactory. (For email transmission, use a subject line similar to that for the text file with the addition of the figure number, e.g., “submit prd jones fig1”.)

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Manuscripts sent by **conventional mail** should be submitted in triplicate to the Editors, Physical Review, 1 Research Road, Box 9000, Ridge, NY 11961-9000. The manuscript, including the abstract, references, and captions, should be neatly printed in English, on good letter-size (e.g., $8\frac{1}{2} \times 11$ in. or A4) white paper with ample margins. (The first copy, used for production purposes if the paper is accepted for publication, must be printed on one side of the paper only; additional copies, used for review purposes, may be printed on both sides of the paper.) The type size and line spacing should be sufficient to accommodate editorial markings and should be legible to our keyboarders (no more than three lines per inch and no more than 88 characters per 6 inches). It should be carefully proofread by the author. Poor reproductions are unacceptable, as are unclear or excessive handwritten insertions.

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An information and instruction booklet regarding electronic submissions and compuscripts is available via ftp to aps.org in the `/pub/jrnls/directory` as the `compu_inform_pr` files (include filename suffix `.asc`, `.ps`, or `.tex`).

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upload, and hard-copy transmission of modified manuscripts. These forms should also be used when a manuscript previously submitted to one APS journal is being submitted in modified form to another one (typically a former *Physical Review Letters* submission being submitted to *Physical Review*). Resubmissions from e-print archives are not yet supported. If you do not use the forms, please include a summary of changes made and a brief response to all recommendations and criticisms; state whether or not the figures have been modified, and supply new PostScript or scanner-reproducible figures if there have been such changes; and update any other information (e.g., address and communication information) that has changed since initial submission.

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For **general format and style** consult recent issues of this journal and the *Physical Review Style and Notation Guide*, available via ftp to aps.org in the `/pub/jrnls` directory as the `style_guide` files (include filename suffix `.pdf`, `.ps`, or `.tex`). Additional style guidelines can be found in the Fourth Edition of the *AIP Style Manual*, which may be obtained for \$10.00 (prepaid) from Springer-Verlag, P.O. Box 2485, Secaucus, NJ 07096-2485.

The **title** should be concise but informative enough to facilitate information retrieval. The **abstract** should be self-contained (contain no footnotes). It should be adequate as an index (giving all subjects, major and minor, about which new information is given) and as a summary (giving the conclusions and all results of general interest in the article). It should be about 5% of the length of the article, but less than 500 words.

Notation should be clear, compact, and consistent with standard usage. **Equations** should be neatly formatted, punctuated, and aligned to bring out their structure, and numbered on the right. (a) Diacritical marks (tildes, etc.) can be put over any symbol, including indices. (b) Three-vectors are generally set in roman boldface type. More general vectors,

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References and footnotes to text material are usually combined in a single list, numbered consecutively in their order of first appearance in the paper, and placed in a double-spaced list at the end of the text material. They should be designated and cited in text by on-line Arabic numerals in square brackets. As an option, footnotes may appear separately from references and be placed at the bottom of the page on which they are cited. They should be designated by superscript numbers and numbered consecutively throughout the paper. Footnotes within tables should be designated by lower-case letter superscripts and given at the end of the table.

For the proper form for references, see the *Physical Review Style and Notation Guide* and recent issues of this journal. The names of all authors of works cited should be given in the references, unless the number of authors is greater than three; in this case, the first author's name followed by *et al.* is allowed. When reference is made to internal reports or other items not available in the open literature, it is the responsibility of the author to provide sufficient information to enable the reader to obtain a copy of the referenced material. References to classified reports or other documents with restricted circulation should be avoided. 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.

Footnotes to an author's name or address should be limited to those useful for location of, or communication with, an author. Footnotes giving electronic addresses (e.g., email, fax, or Web) of a corresponding author are encouraged. All information concerning research support should appear in the acknowledgments.

Separate **tables** (numbered in the order of their first appearance) should be used for all but the simplest tabular material; they must have captions, which should make the tables intel-

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The decision on whether results should be published in long tables depends on the precision of the data, i.e., whether they can be read accurately enough from a figure, and on how many readers are likely to use the numbers relative to the space needed in the journal. If additional numerical data can be obtained from a data center, from the author, or from another source either as tables or on tape, indicate how and in what format they can be obtained.

Figures should be planned for the column width of the *Physical Review* (approximately 8.6 cm, or $3\frac{3}{8}$ in.). In some cases where the figures contain a great deal of detail, $1\frac{1}{2}$ or 2 columns may be used. Wasted space at the top and bottom should be avoided. Carefully prepared figures, suitable for digital scanning, are required (original India-ink drawings or glossy prints; computer-generated figures, if of sufficient quality, are acceptable). Figures must have a clear background and unbroken lines with as much black-white contrast as possible. *Final-journal-size* originals or prints are preferable to oversized originals. Avoid small open symbols which tend to fill in upon reduction, small dots and decimal points, and shading or cross-hatching that is not coarse enough to withstand reproduction. The lettering and plotted points on the figures should be large and clear enough that they will be legible on the journal pages (final journal size of lettering should be at least 2 mm). Inconsistently large or too heavy lettering should be avoided. Line weights should be consistent throughout a figure, with a final line weight of at least 0.18 mm (0.5 point). Figures reproduced directly from an automatic plotter or computer printer must have lettering of the correct size and style (e.g., MeV instead of MEV, unslashed zeros) and curves that are smooth and of sufficient line weight to allow suitable reproduction. The resolution of the drawing software and the output device should be set as high as possible (preferably 600 dpi or higher). Very fine lines in laser-generated illustrations will disappear under scanning. Photographs of apparatus are unacceptable and should be replaced by good schematic diagrams.

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Some figures might be more effective in **color**. This option is available; price schedules can be obtained from the Editorial Office at Ridge. The cost of publishing illustrations in color must be borne in full by the respective authors and their institutions. Authors who wish to avail themselves of this option should provide 35-mm slides or transparencies, or

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