Manuscripts that report the results of research in nuclear physics and related fields may be submitted to Physical Review C. The manuscripts must contain new results and not be in editorial process at another journal. (For details, see “Physical Review C Editorial Policies and Practices” in this issue.)

Articles published in Physical Review C are grouped under headings in the table of contents. The headings now used are as follows:

- Nucleon-Nucleon Interaction, Few-Body Systems
- Nuclear Structure
- Nuclear Reactions
- Relativistic Nuclear Collisions
- Hadronic Physics and QCD
- Electroweak Interaction, Symmetries
- Nuclear Astrophysics

Authors should suggest the headings that are most appropriate.

This journal, and more detailed information about it, can be found on the World Wide Web at the URL http://prc.aps.org/. Prospective authors are particularly advised to consult the information accessible via the Authors and Manuscript Submission subpages. Those looking for a specific known file may find it more convenient to consult the alphabetical listing available at the Author Forms subpage of http://forms.aps.org/author.html.

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Manuscripts sent by conventional mail should be submitted to the Editor, Physical Review C, 1 Research Road, Box 9000, Ridge, New York 11961-9000. Manuscripts should be double-spaced, on one side of the paper only (about 6 mm of space between lines) with ample margins, on white letter-sized paper. Poor copies and unclear or excessive handwritten inserts are not acceptable.

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

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The Division of Nuclear Physics of the APS requests that authors provide a Keyword Abstract. Please consult http://www.nndc.bnl.gov/nndc/physrev_keywords/ for further information and submission details. The Keyword Abstract should be forwarded to the National Nuclear Data Center.

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The writing of the title deserves special care. It should convey the greatest amount of information in the smallest number of words. Words that do not carry information, such as “The...”, “A...”, “On...”, “Investigation of...”, “Study of...”, should be omitted. For manuscripts submitted to the Comments section, “Comment on...” followed by the title of the paper to which the Comment refers is, however, good practice. Do not use in the title words that praise the quality of the work (precise, important, accurate), the name of the accelerator or type of detector used, names of people or places, coined words or acronyms, “More about...”, “...revisited”, or dangling participles (...using...). Do not use serial numbers in titles unless the number is followed by a specific title, such as “Inelastic scattering of protons. IV. Coupled channels analyses.” If you wish to use a serial number, please provide information on the other published articles in the series.

The names of authors may be listed in any order in the byline at the beginning of a paper. The author who submits the paper is responsible for ensuring that all coauthors have approved the paper and for checking that the form of each name (e.g., initials versus full names) is that normally used by the author.

Affiliations of authors should be given without abbreviation. (Use Massachusetts Institute of Technology, not MIT.) Give the city, state, and zip code for U.S. addresses; add the country for other addresses. Affiliations must be institutions, not conferences, collaborations, or temporary meeting places.

If the authors are at different institutions, they may be grouped by institution with the name of the institution following each group. If the authors are not grouped by institution, the names of institutions may be repeated following the appropriate authors or groups of authors. If this becomes cumbersome, the names of institutions may be listed following the list of authors. Each author’s name should then be followed by a superscript number (or numbers) that refers to a similar superscript number preceding the appropriate institution (or institutions). Normally, the most concise presentation is preferred.

Footnotes to an author’s name or address are intended to facilitate locating or communicating with an author. In many cases, it can be helpful to identify an author as “spokesperson” or “author to whom correspondence should be addressed.” Footnotes giving email addresses of one or more corresponding authors are strongly encouraged. All information concerning research support should appear in the acknowledgments. Footnotes which describe an author’s position or title are not acceptable.

Every paper must have an abstract. It should be about 5% of the length of the article, but less than 500 words. It should state all subjects about which new information is given and the conclusions and results. For experimental papers it should specify clearly what quantities were measured, what nuclides were studied at what energies. It should not contain footnotes, coined words, or acronyms that are not explained.

Physical Review C tries to follow the recommendations on symbols and units of the International Union of Pure and Applied Physics (IUPAP) and of the National Institute of Standards and Technology. Metric units (preferably SI), not British units, are used, unless the British unit is part of the name of an object.

Recommended abbreviations for frequently used terms are listed below along with some common misuse.

<table>
<thead>
<tr>
<th>Use</th>
<th>Do Not Use</th>
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<tbody>
<tr>
<td>µm</td>
<td>µ</td>
</tr>
<tr>
<td>nm</td>
<td>mµ</td>
</tr>
<tr>
<td>fm</td>
<td>F (F is for farad)</td>
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<tr>
<td>g</td>
<td>gm</td>
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<tr>
<td>A</td>
<td>amp</td>
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<tr>
<td>K</td>
<td>°K</td>
</tr>
<tr>
<td>sr</td>
<td>Sr, ster, str</td>
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<tr>
<td>u</td>
<td>amu</td>
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<tr>
<td>cm³</td>
<td>cc</td>
</tr>
<tr>
<td>deg</td>
<td>DEG, DEG., deg.</td>
</tr>
<tr>
<td>keV</td>
<td>KEV, KeV</td>
</tr>
<tr>
<td>MeV</td>
<td>Mev, MEV</td>
</tr>
<tr>
<td>MeV/nucleon</td>
<td>MeV/u, MeV/amu, MeV/A</td>
</tr>
<tr>
<td>µN</td>
<td>n.m.</td>
</tr>
<tr>
<td>c.m. (=center of mass)</td>
<td>CM</td>
</tr>
<tr>
<td>arb. units</td>
<td>a.u. (a.u. is for atomic units)</td>
</tr>
</tbody>
</table>

Physical Review C follows the recommendations of the S.U.N. Commission of IUPAP on the symbols to be used for nuclides and their states. The nucleon number (mass number) of a nuclide is shown as a left superscript (14 N). A right superscript is used for indicating a state of ionization (Ca²⁺) or an excited state (¹¹⁰ Ag⁺, ¹⁴ N⁺). A right subscript is used for indicating the number of atoms in a molecule (¹⁴ N₂). For bombarding particles, n, p, d, t, h, and α may be used, but
not \( \tau \). For other bombarding particles, only the usual symbols \( ^6\text{Li}, ^{12}\text{C}, \ldots \) should be used. For target nuclides, use \( ^1\text{H}, ^2\text{H}, ^3\text{H}, ^3\text{He}, ^4\text{He}, \ldots \). Do not use D, T, \ldots.

The preferred notation for a differential cross section is \( \sigma(\theta) \), \( \sigma(E, \theta) \), i.e., the angle or energy should be shown as an argument. The derivative notation \( d^2\sigma/d\Omega\,dE \) is acceptable; \( d^2\sigma \) by itself or \( d\sigma/d\Omega\,dE \) is not. The notation \( dM/dA \) or \( ds/dZ \) is acceptable when it refers to a mathematical relationship, such as the semiempirical mass formula, but not for the characterization of data, since \( A \) and \( Z \) are not continuous.

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, matrices, etc., are usually set in lightface italic type, although boldface may alternatively be used. (c) Be careful when using the solidus (/) in fractions. For example, \( 1/2a \) means \( 1/(2a) \), not \( (1/2)a \). Use appropriate bracketing if needed to ensure clarity.

References cited in text material must be numbered in order of their first citation, and should appear in a separate double-spaced list at the end of the text. They should be designated by on-line Arabic numerals enclosed in square brackets. Footnotes (for subsidiary remarks, not for references) may be placed at the bottoms of published pages. Such footnotes to text material should be designated by superscript numerals, numbered consecutively throughout the paper, and placed at the bottoms of the manuscript pages on which they are cited. Authors who do not wish to use this option should combine references and footnotes in a single list, designated by on-line numerals in square brackets, numbered consecutively in order of first citation, and placed at the end of the text. References and footnotes within tables should be designated by superscript lower-case roman letters and given at the end of the table.

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*et al.* The use of *et al.* (no comma before *et*) is encouraged in the body of the paper, but discouraged in the references. The names of all authors should be given in the references, unless the number of authors is greater than ten.

(submitted or to be submitted) means that the paper has been submitted or will shortly be submitted for publication. The name of the journal, book, or conference proceedings must be specified.

(unpublished) means that the information is unavailable in formally published form. Ph.D. theses need not be marked (unpublished), since copies can be purchased.

Conference Proceedings. Name, place, and year of the conference should be specified. Specify the editors and publisher if possible. Give page number.

Preprints and Reports (electronic or hard copy). Give name of laboratory, preprint or report number, and year. Give the title if possible and especially if a preprint or report number is not available.


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It is important to confirm the accuracy of bibliographic information in references. This has become more important now that the journal is online; establishing functional hyperlinks from reference lists to bibliographic and document databases depends on the accuracy of the data contained in the anchor reference. 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.

Acknowledgments of support must be placed in an acknowledgments paragraph at the end of the text of a manuscript. Not all types of acknowledgments are appropriate for the Physical Review. We do not include acknowledgments to those who helped in the preparation of the document being published; to referees or editors (unless they were involved before the paper was first written); to those who contributed general encouragement (family, friends) or services that were not directly part of the research. References to positions, titles, and awards are inappropriate as are dates associated with awards. Examples of suitable acknowledgments are thanks to other scientists for scientific guidance given in discussions or by the communication of results, mention of technical assistants who helped in the actual research, and citation of funding
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Separate tables (numbered in the order of their appearance) should be used for all but the simplest tabular material; they should have captions that make the tables intelligible without reference to the text. Units should be given in the column headings. 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 experimental results are likely to be used as reference values by other authors, the publication of the numbers is desirable. Material more extensive than is appropriate for the journal article, or of special types (e.g., color figures, multimedia, program files) may be deposited in the Electronic Physics Auxiliary Publication Service (EPAPS) of the American Institute of Physics. Information about EPAPS is available via the Authors' upload page at the Manuscript Preparation section. If additional numerical data can be obtained from a data center, from the author, or another source, either as tables or in electronic form, indicate how and in what format they can be obtained.

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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An example of data should be presented (such as an energy distribution, time-of-flight spectrum, or coincidence spectrum) to show the quality of the data. If results depend on theoretical assumptions, state what the assumptions are. If the measurement is relative to a standard, such as an energy or cross section, state what reference value was used. If results depend on a sign convention, state the convention and give references.

Specify uncertainties. Distinguish statistical and other errors. In the case of measurements relative to a standard, state whether the error includes the error in the standard.