

# Editing and Formatting Rules for *NCSLI Measure* Papers

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This document contains information about how papers should be edited and formatted before submission to *NCSLI Measure*. If you have questions or need clarification, please contact Michael Lombardi, Managing Editor, at: lombardi@ncsli.org

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## 1. General Guidelines for Writing High Quality Technical Papers

The keys to writing a good scientific paper are focus, organization, command of the subject, quality of research, and writing quality. Please keep these things in mind when writing papers for *NCSLI Measure*:

- Define the topic for the paper in the abstract and/or introduction, and then stay focused on the topic for the entire paper, without discussing unrelated or only loosely related material.
- Organization is critical (probably the hardest part of writing a scientific paper, it is good to start with an outline). The ideas presented should build on each other and must be in the right order.
- Command of the subject is a hard thing to explain, but readers can tell when the author really knows the material they are writing about. It gives the reader confidence that the paper is valid. Study your subject thoroughly before writing. That way, you can avoid "hand waving" or glossing over important material.
- Quality of research means that the author has read and is familiar with all of the relevant literature in their field, and cites accordingly. Take the time to be familiar with the literature in your field. Don't omit important references, and don't reference anything that you haven't read.
- Writing quality speaks for itself. The easier the paper is to understand, the better. Short sentences and short words are generally better than long sentences and long words. If a sentence is ambiguous and can have more than one meaning it needs to be rewritten. Remember that there is a difference between scientific writing and creative writing, the goal of scientific writing is to communicate ideas without ambiguity. Some authors deliberately try to make themselves seem "smarter" by using obscure words, long sentences, unnecessary equations, etc., which is not a good idea because it makes the paper harder to understand.

## 2. General Guidelines for Submission Format

Papers should be submitted as Microsoft Word files, preferably as “.docx” files created with Word 2007 or Word 2010. Equations should be generated using either MathType or the built-in equation editor.

Technical papers should not exceed 7,500 words. Technical notes should not exceed 3,000 words.

The submitted manuscript should be a single file that includes the figures, illustrations, and photos. Use the Arial 14 point font for section headings, and Times Roman 12 point font for the text.

If the paper is accepted for publication the editor will ask for separate files for figures and illustrations (JPG or TIF formats are preferred) in the highest resolution possible (at least 300 dpi). The editor might also ask for Microsoft Excel files, if graphs are created in Excel. Therefore, please keep all of these files available.

## 3. Paper Sections

- An abstract should be at the top of every paper. It should succinctly describe your entire paper. The length of the abstract should not exceed 200 words and should be a single paragraph with no indentation.
- Each section, excluding the abstract but including the reference section, should be numbered. Arabic numbers should be used, for example, “1. Introduction”. Subheadings should be numbered as 1.1, 1.2, and so on. Avoid having more than one level of subheading.
- The words in section headings (excluding words such as “and”, “of” and “the”) should be capitalized. For example:

5. Use of the High Speed Digital Camera

## 4. Indentation

- Do not indent abstracts.
- Do not indent the first paragraph of a section. All other paragraphs should be indented.

## 5. Variables

- All variables should be italicized, but their subscripts or superscripts usually are not in italics, nor are the parentheses that enclose them. For example:  $D(x)$
- Vectors and matrices are italic and bold:  $\mathbf{M}_x$
- When defining a variable in the text, it is usually offset with commas: The temperature of the sample,  $T_s$ , is measured using a thermocouple.
- If a variable has both a superscript and subscripts, the superscript is usually placed close to the variable: For example write  $u_{\text{var}}^2$  not  $u_{\text{var}}^2$ .

## 6. Equations

- Center equations on the page with numbers in parentheses at the right margin. Each equation that is offset from the text should be numbered consecutively with Arabic numerals starting with “(1)”.
- Refer to equations in the text as Eq. (1), etc., except at the beginning of a sentence where “Equation (1)” should be used.
- Equations should be punctuated. For example, if an equation appears at the end of the sentence, there should be a period “.” following the equation. A comma “;” can be used if the sentence continues after the equation. Please note that punctuation marks often need to be spaced apart from the equation so that they do not appear to be part of the equation.
- Use spaces on both sides of mathematical operators for all equations. For example, use  $k = 2$  rather than  $k=2$ .
- The math symbol  $\times$  should be used for multiplication, not the small letter x. For example,  $5 \times 10^{-8}$  is correct, not  $5 \times 10^{-8}$ . There should always be a space on both sides of all math operators, including  $\times$ .
- Mathematical variables should always be italicized in the text. For example:

“the physical principle, known as the Josephson effect, is expressed as  $V = nf / K_J \dots$ ”

## 7. Figures and Tables

- Figures and tables should appear in the manuscript as soon as is practical after their mention in the text.
- Figures and tables should be numbered consecutively with Arabic numerals starting with “1”.
- Captions should appear below figures and tables, aligned with the left edge, and end with a period. Only the first letter of the first word should be capitalized within the caption. The word Figure or Table and the number should be **Bold** in the caption. For example:

**Table 3.** Time synchronization requirements for the electric power industry.

- All key words in table heading captions should be capitalized. For example: “Error Sources”.
- Captions should be as concise as possible. Try to avoid captions that are more than two lines long. Detailed descriptions should be given in the text, not in the caption.
- When referring to tables in the text, always use the form “Table 1”. When referring to figures in the text, used the form “Fig. 1”, except at the beginning of a sentence where “Figure 1” is the correct form. Do not use expressions such as “as shown in the figure below.”
- Tables should be created using the “Insert Table” feature in Microsoft Word. Do not insert tables as graphics files.

## 8. Numbers

- Never hyphenate numbers with unit symbols even when used as adjectives (e.g., 0.25 cm thick plate is the correct form; 0.25-cm thick plate should not be used). Always rearrange the words to avoid ambiguity. For example, the sentence “The samples were placed in 22 mL vials,” could suggest that there were 22 vials. It could be rewritten as “The samples were placed in vials of volume 22 mL.”
- Always spell out numbers less than 10 (single digit numbers) when they are used without a measurement unit. For example:

“We repeated the experiment five times.”

However, use the number if there is a unit (even if the number is single digit):

“The wavelength was 5 cm.”

- If the “±” symbol is treated as a sign to mean a range of numbers (plus or minus 5), there should not be a space between the sign and the number. For example, “±5”. However, if the “±” symbol is treated as a mathematical operator, it should have a space on both sides. For example:

$$10 \pm 0.1$$

## 9. References

- All technical papers should include at least several references. It is important for authors to be familiar with the previously published scientific literature that relates to their topic. Do not reference papers or books that you have not read or that do not apply to your paper. Please carefully check all of your references to avoid errors with author names, titles, page numbers, and so on.
- The best references are usually papers from peer reviewed journals, books, and other material that has been extensively checked before publication. However, conference papers are often suitable references, especially when no other literature on the subject is available. Avoid reference unpublished material, private correspondence, power point presentations, etc.
- Indicate literature references in the text and in the list of references by numbers in brackets. Reference numbers should start with [1] and continue in order. Never use superscripts for references; they can be confused with exponents. Superscripts are used for footnotes.
- When a standards document or book is mentioned in the text, the name of the document should always be in italics:

“According to *ISO 17025*, the ....”

- When citing references in the text, place the reference number in brackets before the punctuation that indicates the end of the sentence. For example:

impact on the measurement uncertainty [4].

not

impact on the measurement uncertainty. [4]

- The following information should be included in references:
  - ✓ The place of publication (journal name, conference name, government publication name, etc.) should be in italics. For example, *NCSLI Measure*; *Proceedings of the 2006 NCSLI Conference*; *NIST Special Publication 100*; *ISO 17025*.
  - ✓ Journal names should be abbreviated using the abbreviations specified by Web of Science:
 

[http://images.webofknowledge.com/WOK46/help/WOS/A\\_abrvjt.html](http://images.webofknowledge.com/WOK46/help/WOS/A_abrvjt.html)

If a journal is not listed by Web of Science, spell out the entire journal name. All journal names should be printed in italics.
  - ✓ The paper title should be between quotation marks; the volume and number should be lower case and abbreviated; and page numbers should be preceded by pp. (*Metrologia*, vol. 6, no. 4, pp. 65-72, 2008.)
  - ✓ Book titles should be in italics.
  - ✓ The names of all authors (initials then last name) should be included, regardless of the number of authors. Do not use et. al. (A.E. Watters, J. Posha, and J.R. Post). If there is more than one author, the word “and” should be before the last author.
  - ✓ If the referenced document is part of a larger document (such as a chapter or section of a book), page numbers should be included.
  - ✓ A date should always be included at the end of the reference.
  - ✓ If the reference is to a web site, the URL should be checked to make sure it works. Avoid using long URLs if possible. No one is likely to type them in, and they are likely to change and be wrong later.

The table below shows the reference format for conference papers, journal articles, books, and standards documents:

Conference Paper	C. D. Ehrlich and R. Dybkaer, “Uncertainty of Error: The Error Dilemma,” <i>Proceedings of the NCSL International Workshop and Symposium</i> , National Harbor, Maryland, 2011.  Note: The NCSLI proceedings do not include page numbers, but be sure to include page numbers if they are available.
Journal Article	J. A. Beardon and H. M. Watts, “A re-evaluation of the fundamental atomic constants,” <i>Phys. Rev.</i> , vol. 81, no. 1, pp. 73-81, 1951.
Book	J. V. Nicholas and D. R. White, <i>Traceable Temperatures</i> , John Wiley & Sons, 2 <sup>nd</sup> edition, 2001.
Standards Document	ANSI/NCSLI, “Requirements for the Calibration of Measuring and Test Equipment,” <i>ANSI/NCSL Z540.3</i> , 2006.
NCSLI Measure	J. Stoup and B. Faust, “Measuring Step Gauges Using the NIST M48 CMM,” <i>NCSLI Measure J. Meas. Sci.</i> , vol. 6, no. 1, pp. 66-73, March 2011.

## 10. SI Units

- All manuscripts must use the International System of Units (SI). The recommended reference for SI unit usage is *NIST Special Publication 811*, 2008 Edition, “Guide for the Use of the International System of Units (SI),” by B. N. Taylor. This publication is available free from NIST at:

<http://physics.nist.gov/cuu/pdf/sp811.pdf>

- A space should always be inserted between the number and the unit, for example “3 cm”. The percent sign (%) is considered a unit, and thus “3 %” is the correct form.
- For reasons of readability, particularly if the article is a tutorial, you might choose to spell out the SI units, rather than abbreviate them, for example, “5 liters” instead of “5 L”. Whichever method is chosen, it needs to remain consistent throughout the entire article. Don’t abbreviate the unit in some places, and spell it out in others.
- The SI unit should always be spelled out when used without a number. For example, “a few meters” is correct, and “a few m” is incorrect.
- SI unit abbreviations should only be capitalized if the unit name was the last name of a person, for example “Hz” and “W”. The one exception is the abbreviation for liter, use a capital “L” to avoid confusion with the number 1.
- SI unit names are not capitalized even if they are derived from the name of a person, for example, “hertz”, “pascal”, “watt”, etc.