Title of the article

(Should be concise, clear, descriptive, and no more than 14 words)

#### Title in Spanish

#### 

\*Complete name of the author

Position and institutional affiliation

e-mail: xxxx@ xxxxx

Orcid[[1]](#footnote-1)Code

Abstract:

Summary of the manuscript with no more than 250 words and written in both English and Spanish. It must include the objective, methodology, results, and discussions or conclusions of the study.

Keywords: Include a list of 5 keywords. Capitalize the first word of the list and lowercase the rest. The words should appear in alphabetical order.

Resumen:

Resumen que debe escribirse tanto en español como en inglés, con una extensión máxima de doscientas cincuenta palabras. En caso de ser un artículo en inglés, se debe agregar un resumen en español. Debe expresar el objetivo, metodología, resultados, hallazgos o conclusiones, o apartados pertinentes al trabajo.

Palabras clave: Se debe incluir al menos cinco palabras. Según el sistema IEEE (Institute of Electrical and Electronics Engineering), la primera palabra debe aparecer en mayúscula y el resto en minúscula. Asimismo, las palabras deben aparecer en orden alfabético.

**NOMENCLATURE**

In some cases, is necessary to include a nomenclature section after de abstract and keywords. If you need to do it, use a standard one on the article.

I. BODY OF THE ARTICLE

Wording in the document should be concise and clear, organize in a column, and divide into sections. Pages and lines must be numbered. The document must be written in Times New Roman size 11, double space and with a maximum extension of 30 pages letter size[[2]](#footnote-2).

Typically, articles are comprised by an introduction, methodology, results, discussion, conclusions, acknowledgements, and references; however, the authors decide if they want to merge the results and discussion in one section. The main objective of the article must be stated explicitly in the introduction, and the funders must be mentioned on acknowledgements.

A. SI

This journal follows the N° 5292 Law [Ley N° 5292] of the Republic of Costa Rica, in which the country adopts the SI System as the default unit system. You can check the following link <http://www.pgrweb.go.cr/scij/Busqueda/Normativa/Normas/nrm_articulo.aspx?param1=NRA&nValor1=1&nValor2=5650&nValor3=5994&nValor5=28793>). Moreover, you can refer to page 6 of *La Gaceta* N°56, published on March, 21 of 2011 (Spanish) and <https://www.bipm.org/utils/common/pdf/si-brochure/SI-Brochure-9.pdf> (English and French).

B. Authorization for the use of materials

Authors must obtain a written authorization in case they reproduce material that has appeared on previous publications and are protected by copyright.

C. Equations, matrices, mathematical formulas and terminology

These mentioned elements should be edited using a program such as Microsoft Word. All symbols and nomenclature used must be clearly defined; for instance, the difference between uppercase and lowercase letters, between the letter “o” and number zero, and between letter I, number one, and the apostrophe. Equations should appear flushed left and be numbered consecutively with Arabic numbers; these numbers should appear at the right side of the equation between parentheses. Matrices should be named with uppercase letters and vectors with lowercase letters like the following example:

 (1)

D. Tables

For the use of tables, do not repeat information that appears in the text and use the format TABLE I, TABLE II… to name them. According to IEEE, after “TABLE #”, a caption that describes the content of the table should be included. Moreover, authors must specify the source from which they took the table.

TABLE I

VV SPEEDS OF COMPRESSIONAL WAVES AT DIFFERENT DEPTHS

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| *Yi* [m] | 0 | 2 | 4 | 6 | 8 | 10 | 12 |
| *vv (yi)* [m/s] | 290 | 690 | 840 | 900 | 930 | 940 | 950 |

.

E. Figures

Figures must present a simple and clear style. As tables, repeated information should be avoided. Use programs that enhanced image quality. If the figure was taken from another source, please cite that source correctly. Moreover, scales and units should be clear, and all figures must be named Fig. with a respective number in the text along with a caption that explains the figure.

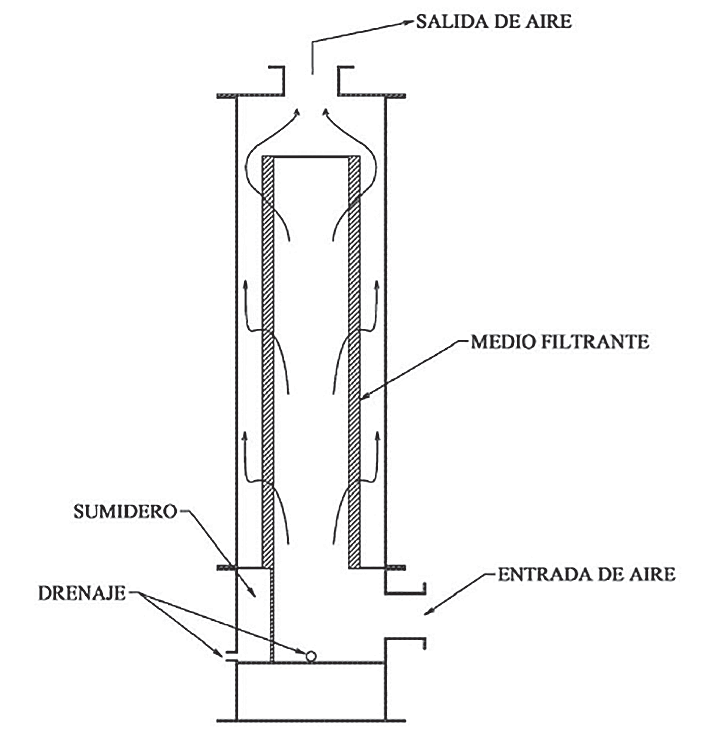


Fig. 1. Cross section of the structure of a coalescing filter.

F. Lists

IEEE manual mentions three types of lists in the text: run-in lists, displayed lists, and where lists. Run-in lists must be grammatically correct. They must also be introduced by a colon, separated by semicolons. Example: text text text text: 1) text text text; 2) text text text; y 3) text text text.

Displayed lists may be either incomplete sentence items or full sentence items. For example:

1) text text text text;

2) text text text text;

3) text text text text.

Finally, where lists define variables in the equations preceding the list.

G. In-text citations

According to IEEE manual, references do not need to be cited in the text. However, when they are cited, they appeared in the same sentence of the reference, between square brackets and within the correspondent punctuation. For example:

as showed by Brown [4], [5]

as mentioned before in [2]

In [4] y [5]

According to [6]

The name of the author should not be included in a text reference with a number (i.e., “In Smith [1]”) and should be changed to “in [1]” except in such cases where the author’s name is integral to the understanding of the sentence, for example:

Smith [1] reduced calculated time …

Wood *et al*. [7] applied arbitrary constants…

If you want to cite the exact words of another author, the cited information should appear between quotation marks (“”) adding the page number within the brackets. For example:

As result, this “text text text” [4, p. 5]

If the quote has more than three lines, the manual recommends starting the quotation on a new line with a smaller font size. For example:

Wilde mentions that:

xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx [9, p. 4]

If you need to cite more than one source within the same sentence, these citations Will be separated with commas or a dash. For example:

Several authors have exposed the importance of this issue [3], [6], [8]

Several authors have exposed the importance of this issue [3]-[6]

It is important to remember that the IEEE advices to avoid the use of secondary references, this means that it is better not to use a reference of an author cited in another manuscript, but to go to the source itself to mention it in the text.

II. Conclusions

Acknowledgement

Acknowledgements should be at the end of the article.

The Roles OF THE AUTHORS:

CRediT (Contributor Roles Taxonomy) is high-level taxonomy, including 14 roles, that can be used to represent the roles typically played by contributors to scientific scholarly output. The roles describe each contributor’s specific contribution to the scholarly output. Nowadays, many editorials and journals have implemented this taxonomy in their publications. In CASRAI website you can find more information about the taxonomy and its implementation [1].

The authors must generate a complementary document that must be sent with the manuscript. In this document the roles of the authors must be detailed. Each author may have different roles and each role can be employed by different authors.

The taxonomy is divided in the following roles:

Conceptualization – Ideas; formulation or evolution of overarching research goals and aims.

Data curation – Management activities to annotate (produce metadata), scrub data and maintain research data (including software code, where it is necessary for interpreting the data itself) for initial use and later re-use.

Formal analysis – Application of statistical, mathematical, computational, or other formal techniques to analyze or synthesize study data.

Funding acquisition ​- Acquisition of the financial support for the project leading to this publication.

Investigation – ​Conducting a research and investigation process, specifically performing the experiments, or data/evidence collection.

Methodology – Development or design of methodology; creation of models.

Project administration – Management and coordination responsibility for the research activity planning and execution.

Resources – Provision of study materials, reagents, materials, patients, laboratory samples, animals, instrumentation, computing resources, or other analysis tools.

Software – Programming, software development; designing computer programs; implementation of the computer code and supporting algorithms; testing of existing code components.

Supervision – Oversight and leadership responsibility for the research activity planning and execution, including mentorship external to the core team.

Validation – Verification, whether as a part of the activity or separate, of the overall replication/reproducibility of results/experiments and other research outputs.

Visualization – Preparation, creation and/or presentation of the published work, specifically visualization/data presentation.

Writing – original draft – ​Preparation, creation and/or presentation of the published work, specifically writing the initial draft (including substantive translation).

Writing – review & editing – Preparation, creation and/or presentation of the published work by those from the original research group, specifically critical review, commentary or revision – including pre- or post-publication stages.

Example:

Diego Hidalgo-Leiva: Conceptualization, formal analysis, funding acquisition, writing – review & editing, visualization. Andrés Picado-Arguedas: Methodology, formal analysis, investigation. Natalia Sánchez-Vargas: Methodology, formal analysis, investigation, writing – review & editing.

[1] CASRAI. "CRediT – Contributor Roles Taxonomy". casrai.org. https://casrai.org/credit/ (accessed July 5, 2021).

ReferencES

According to IEEE manual, references should be numbered between square brackets and be set flushed left. The given name of the author is abbreviated to the initial only and precedes the last name. If there are more than six names listed in the reference, use the primary author’s name followed by *et al*. All references should end with a period unless they end with an URL. Moreover, we strongly recommend the use of DOIs over the URLs. For more information regarding the proper citation, you can check <https://ieeeauthorcenter.ieee.org/wp-content/uploads/IEEE-Reference-Guide.pdf>.

**BOOKS**

The following examples are the basic format of IEEE[[3]](#footnote-3).

Initials. Last Name, “Title of the chapter in the book,” in *Title of his/her published book*, xth ed. City of publisher, Country: Publisher, year, ch.x, sec. x, pp. xxx-xxx.

Examples[[4]](#footnote-4):

**Basic format**

[1] B. Klaus and P. Horn, *Robot Vision.* Cambridge, USA: MIT Press, 1986.

**Chapter of book without editor**

[2] L. Stein, “Random patterns,” in *Computers and You,* J. S. Brake, Ed. New York, NY, USA: Wiley, 1994, pp. 55–70.

**Books, Monographs Online**

Initials. Last Name, “Title of the chapter,” in *Title of the book*, x ed. City of publisher, Country: Publisher, year, ch., sec., pp. xxx-xxx. [Online]. Available: <http://www.web.com>

Example:

[3] G. O. Young, “Synthetic structure of industrial plastics,” in *Plastics, vol. 3, Polymers of Hexadromicon*, 2nd ed. New York, NY, USA: McGraw-Hill, 1964, pp. 15–64. [Online]. Available: <http://www.bookref.com>

**Chapter of book with Editor**

Initials. Last Name, “Title of chapter,” in *Title of book*, Editor’s name, Ed., City of publisher, Country: Publisher, year, ch., sec., pp. xxx-xxx.

Example:

[4] L. Stein, “Random patterns,” in *Computers and You,* J. S. Brake, Ed., New York, NY, USA: Wiley, 1994, pp. 55–70.

**CONFERENCES**

Initials. Last Name, “Title of paper,” presented at *Name of Conference*, City of Conference, Country, month and day (s), year, Paper number.

Example:

[5] D. Caratelli, M. C. Viganó, G. Toso, and P. Angeletti, “Analytical placement technique for sparse arrays,”

presented in *32th ESA Antenna Workshop*, Noordwijk, The Netherlands, Oct. 5–8, 2010.

**Conference Proceedings in Print**

Initials. Last Name, “Title of paper,” presented at *Name of Conference*, City of Conference, Country, month and day (s), year, pp. xxx-xxx.

Example:

[6] A. Amador-Perez and R. A. Rodriguez-Solis, “Analysis of a CPW-fed annular slot ring antenna using DOE,” in *Proc. IEEE Antennas Propag. Soc. Int. Symp.*, Jul. 2006, pp. 4301–4304.

**Conference Proceedings with DOI**

Initials. Last Name, “Title of paper,” in *Name of Conference*, (location of conference is optional), year, pp. xxx-xxx, DOI: xxx.

Example:

[7] G. Veruggio, “The EURON roboethics roadmap,” in *Proc. Humanoids ’06: 6th IEEE-RAS Int. Conf. Humanoid Robots*, 2006, pp. 612–617, doi: 10.1109/ICHR.2006.321337.

**Conference Proceedings Online**

Initials. Last Name, “Title of paper,” in *Name of Conference*, (location of conference is optional), year, pp. xxx-xxx. [Online]. Available: <http://www.url.com>

Example:

[8] T. Schubert, “Real challenges and solutions for validating system-on-chip high level formal verification of next generation microprocessors,” in *Proc. 40th Design Automation Conf. (DAC’03)*, Jun. 2–6, 2003. [Online]. Available: http://www.computer.org/csdl/proceedings/dac/2003/2394/00/2394001-abs.html

**Conference Paper Online**

Initials. Last Name. (Date). Title. Presented at Abbreviated Conference title. [Online]. Available: xxxx.

Example:

[9] J. A. Taylor. (Nov. 2006). Assessment: A tool for development and engagement in the first year of university study. Presented at Engaging Students: 9th Pacific Rim in Higher Education (FYHE) Conf., Griffith, Australia. [Online]. Available: <http://www.fyhe.com.au/past_papers/2006/Papers/Taylor.pdf>

**PERIODICALS**

Initials. Last Name, “Name of paper,” *Title of periodical*, vol. x, no. x, pp. xxx-xxx, month, year.

Example:

[10] M. Ito *et al*., “Application of amorphous oxide TFT to electrophoretic display,” *J. Non-Cryst. Solids,* vol. 354*,* no. 19, pp. 2777–2782, Feb. 2008.

**Periodical with DOI**

Initials. Last Name, “Name of paper,” *Title of periodical*, vol. x, no. x, pp. xxx-xxx, month, year. DOI: xxx.

Example:

[11] M. M. Chiampi and L. L. Zilberti, “Induction of electric field in human bodies moving near MRI: An

efficient BEM computational procedure,” *IEEE Trans. Biomed. Eng.*, vol. 58, no. 10, pp. 2787–2793, Oct.

2011, doi: 10.1109/TBME.2011.2158315.

**Periodicals Online**

Initials. Last Name, “Name of paper,” *Title of periodical*, vol. x, no. x, pp. xxx-xxx, month, year. [Online]. Available xxx.

Example:

[12] P. Kopyt et al., “Electric properties of graphene-based conductive layers from DC up to terahertz range,”

*IEEE THz Sci. Technol.* [Online]. Available:

https://ieeexplore.ieee.org/document/7463081

**REPORTS**

Initials. Last Name, “Title of report,” Name of Company, City, Country, pp. xxx-xxx, Report number, year.

Example:

[13] E. E. Reber, R. L. Michell, and C. J. Carter, “Oxygen absorption in the earth’s atmosphere,” Aerospace

Corp., Los Angeles, CA, USA,Tech. Rep. TR-0200 (4230-46)-3, Nov. 1988.

**THESES**

Initials. Last Name, “Title of thesis,” Type of thesis (M.S., Ph.D, etc.), University, City, Country, year.

Example:

[14] J. O. Williams, “Narrow-band analyzer,” T, Dept. Ing. Elect., Harvard Univ., Cambridge, MA, USA, 1993.

**WEBSITES**

Initials. Last Name, “Page Title”. Website Title. Web Address (retrieved Date Accessed).

Example:

[15] J. Smith. “Obama inaugurated as President.” CNN.com.

http://www.cnn.com/POLITICS/01/21/obama\_inaugurated/index.html (accessed Feb. 1, 2009).

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1. The format must the same for all the authors of the manuscript. Moreover, footnotes should be used only if necessary and follow this format. Make sure of the appropriate correspondence between the number on the footnote and the number on the text. [↑](#footnote-ref-1)
2. If the article includes tables and figures, these should be included in a different file from the text. The tables and figures file must include the position of these in the text, their title, and captions; additionally, they should have 300 dpi image resolution in JPG format and medium letter size. [↑](#footnote-ref-2)
3. [1] corresponds to the format of citing a whole book, whereas [2] is the format of citing the chapter and the editor. [↑](#footnote-ref-3)
4. All examples were taken from *IEEE REFERENCE GUIDE*. [↑](#footnote-ref-4)