FIA 2020/22

Instructions and article template for the FIA 2020/22 and XXIX Sobrac meeting

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Abstract

This field is intended for the article's abstract, that should have 180 to 300 words. Title, abstract, keywords and PACS should feature be on the first page (i.e. avoid extending them to the following page). The abstract should make a concise presentation of the scientific-technical article, containing an introduction, the objective, a synthesis of the method, the main result and the final conclusion (preferably in that order). No separate items or sections are required within the abstract. Thus, the reader may acknowledge the essence of the article's content. Remember that the abstract is like a movie trailer, people will consider reading the complete article if the abstract is interesting. The abstract should not contain new information not contained within the article; undefined abbreviations; previous discussion of the literature; references and citations or excessive detail about the methods employed. It is also not the introductory paragraph of the work; this should be placed at the beginning of the text. Use only relevant and useful information, exercising empathy with prospective readers. For a cohesive, elegant abstract that represents the article, write a preview, write the paper completely, and then review it by looking at whether its content consistently reflects the content of the document. Following the abstract, the author should list up to five keywords (avoid using the same words contained in the article's title). PACS identifiers, a hierarchical classification system (more details within the text) should be given too.

Keywords: technical paper, FIA, Sobrac, acoustics, vibration.

PACS: please see the instructions in this template.

1. INTRODUCTION

This template instruction text was elaborated so that authors can elaborate their articles in a standardized way. The text was adapted from the "Acústica e Vibrações" (from Sobrac) journal template, to be used for the 12º Iberoamerican Acoustics Congress integrated with the XXIX Sobrac Meeting. Templates are thought to provide an uniform formatting for all articles of the event. Therefore, in this template, the main guidelines for article elaboration regarding content, graphics, structure, layout presentation and submission are presented. The template implements the custom styles to format the article properly. The author can, therefore, use this file as a template or model for his article. In addition to the present LATEX (`.tex`) template a Microsoft Word (`.docx`) template will be available. This version is also available on Overleaf and GitHub, and is compatible with Windows, Mac and Linux. Depending on the set-up of your TeX distribution you might be required to download and install additional packages or fonts if you decide to compile locally on your machine. Authors are responsible for the article's content, elaboration and submission in agreement with the present template.

The complete text shall use simple line spacing, using 12-pt Times New Roman font and 0-pt spacing before and 12-pt after paragraphs. The template will take care of this automatically. It is common practice to write scientific articles in the impersonal, therefore its practice is recommended. Articles can be written in Portuguese, English[1] and Spanish.

2. BASIC ORIENTATIONS

In this section, a summary of how the article must be structured is presented. For more details, check the specific sections in this template.

1. The provided LATEX and Word templates contain all configurations required for proper formatting that are described in this document. Moreover, this text provides simultaneously instructions for both writing software.

2. The first page of an article written in English should feature the title, authors, affiliations, abstract, keywords, and PACS.

3. The text must be written using standard language's norms.

4. The maximum number of pages is 12, including the title page and pages for appendices, if any.

5. Paper size is A4, with the following margins: 2.1 cm from the top, 2.0 cm from the bottom, 1.9 cm from the left and also 1.9 cm from the right (spacing between columns is 1.1cm).

6. Text must be written in 12-pt Times New Roman, as is in this template.

7. The article can contain figures, tables, boards, codes and equations to be placed in the running text. In the text, if necessary, links are allowed to be inserted. Animations are also allowed, as long as being represented by diagrams in figures.

8. A technical article is expected to have a logical, descriptive structure with reproducible content and a list of all references cited in the text.

3. DOCUMENT AND PRESENTATION

Always insert text between sections or subsections, do not orphan them (beginning a section and going directly to the subsection)

3.1 First page

The first page shall contain the following items to be completed by the authors: title, authors' names, affiliations, abstract, PACS and keywords. If the complete title is too long, a shorter version is requested to be included in the header of the articles' pages.

The abstract should have between 180 and 300 words. Make sure that title, authors' names, affiliations, abstract, PACS and keywords fit on the first page. The abstract should make a concise presentation of the scientific-technical article, containing an introduction, the objective, a synthesis of the methodology, the main result

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[1] Articles written in English by non-native speakers should, by preference, pass a professional revision.

and the final conclusion (preferably in that order). No separate items or sections are required within the abstract. The reader should be able to capture the essence of the article's content. Remember that the abstract is like a movie trailer, people will consider reading the complete article if the abstract is interesting. The abstract should not contain information not contained within the article. Avoid using undefined abbreviations; making discussions of the literature; including references and citations or excessive detail about the methods employed. It is also not the introductory paragraph of the work; the introduction is to be provided at the beginning of the main text on the next page. Use only relevant and useful information, exercising empathy with prospective readers. For a cohesive, elegant abstract that represents the article, write a preview, write the paper completely, and then review it by looking at whether its content consistently reflects the content of the document.

Following the abstract, the author should list up to five keywords. Avoid using the same words contained in the article's title.

After that, there is still the 3–5 PACS (Physics and Astronomy Classification Scheme) code presentation, which is a hierarchical classification system created by the American Institute of Physics (AIP). It aids in identifying fields and sub-fields in physics and related subjects. This classification is used in international journal articles, as well as for some articles to be published in conference proceedings. PACS codes are composed by numbers and letters, e.g., "43.20.Dk" for "Ray acoustic". The authors should look for for the best classification provided by the Journal of the Acoustical Society of America at:

- https://asa.scitation.org/jas/authors/manu script
- https://asa.scitation.org/pb-assets/files/pub lications/jas/Acoustics_PACS-15486972 26033.pdf

The PACS codes should be placed following the abstract.

For the authors' affiliations, use numbers as superscripts. If there are multiple authors with the same affiliation, use only one address but add the different e-mails. When the email domain addresses are the same too, try to shorten them using braces {}. Use a maximum of two lines for each author affiliation. See some of the following examples:

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- Fonseca, W. D'A.[1]; Last name, N.[2]

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[2] Vibration laboratory, Institution, City, State, Country, name@domain.com.

3.2 Number of pages

The complete work should not exceed 12 pages, including the title page, the complete list of references and appendices, if there are any.

To optimize the space available, figures, tables and codes must be presented within the body of the text, using one or two columns depending on their content.

3.2.1 Two level subsection examples

This is a two-level subsection for exemplifying purposes.

3.3 Page and margin sizes

Page size is A4 (210 × 297 mm), and text is to be typeset in two columns, spaced 1.10 cm apart. Headers are different for even and odd pages (as is in this document). Left and right margins should be 1.90 cm, bottom margin is 2.00 cm and top margin is 2.10 cm too. Seek to use all the available area. Exceptions can be admitted, e.g. when it is required to start a new section for instance. These can be allocated in beginning of the next page.

3.4 Characters and Text

The manuscript should use Times New Roman font, as provided by the template. The article's title is to be placed on the first page, flush-left using 18-pt **bold** font. Only its first letter is to be capitalized (except for proper names). Spacing after the title is 22-pt. The section titles should use 12-pt **bold** font, and should be completely capitalized, as presented in this template. Subsection titles use 12-pt **bold** font, and only their first letter is to be capitalized (unless proper names are included). The running text must use simple spacing, 12-pt font, justified (aligned with both margins of the columns) and no indentation is to be used for the first line of every paragraph. Avoid the use of level three subsections, use a list system instead.

Make use of standard and scientific language in the text[2]. Foreign words must be written in italic. Initials, acronyms, abbreviations and/or other compositions that escape from common knowledge should be presented to the reader, e.g., HRTF (*Head-Related Transfer Function*) — are always written using non-italic font, including in equations. Carry out a grammatical and technical revision before submission.

3.5 Spacing between lines and paragraphs

Simple spacing should be employed between lines, as adopted in this instructive document. Vertical separation between paragraphs is provided by the template. For manual adjustment Ms Word users should chose the justified paragraph option (with 12-pt spacing).

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[2]Footnotes can help in clarifying minor details.

3.6 Equations, variables and units

Equations should be inserted in the running text, with proper vertical separations, similar to the example of Equation (1). Equations should be centralized and enumerated consecutively, being this numeration inserted flush right and between parentheses (see example). Remember that equations are textual elements, therefore must be properly punctuated and the following text generally does not initiate with an upper case letter. It is recommended to introduce the nomenclature or definition of a variable right after the variable is presented in the equation.

When an already presented equation is to be cited in the text, one should do as follows: Equation (3) — with only the first letter in upper case and with the respective number in parentheses.

The circle's area (in m^2) is given by

$$A = \pi r^2 \, , \tag{1}$$

being r the radius in meters (m). Remember that variables (like the r in this example) are written in *italic* (both in equations, text, tables or figures). When in the running text, no parentheses should be used around the variable, because the variable's italic font makes it distinctive from the remainder of the text.

However, **units, functions and mathematical operators** are to be written using non-italic font. For instance,"... 32.0 N/m^2 was the applied pressure", or even

$$\int_a^b p(\phi) \, \mathrm{d}p \, , \tag{2}$$

was the calculated integral (notice that the differential operator "d" is using non-italic font), for each angle ϕ in degrees. As mathematical operators, one could mention the sine, $\sin(\theta)$, or the logarithmic operator $\log(y)$, for example.

Subscript or superscript text will only be in italic if corresponding to any pertinent variable. If it is a "complementary name" instead, the text shall be written upright, e.g., P_{total} corresponds to the total pressure in Pa, or S^{tri} corresponds to the triangle area in cm^2. However, regarding a variable, for example, i one must write: the summation
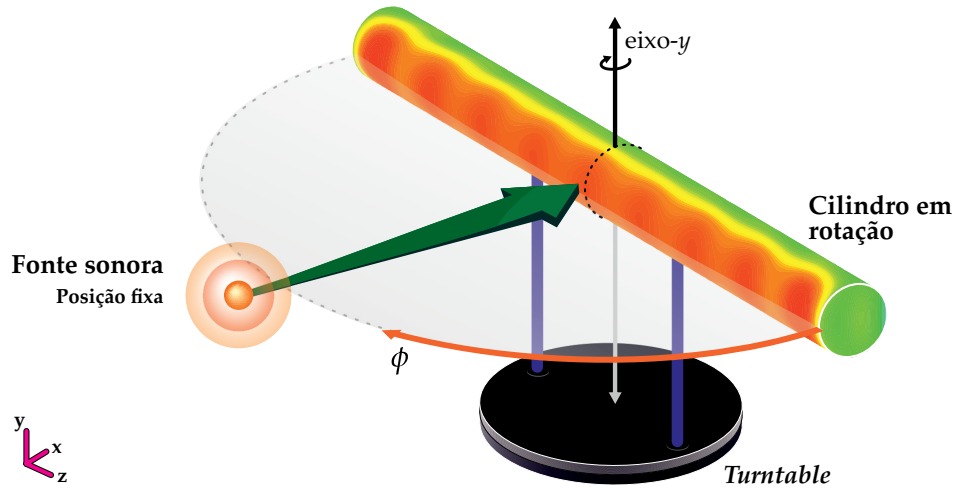
Figure 1: *Beamforming* measurement with cylindrical arrangement (adapted from Fonseca [1]).
Two-columns figure example.

was calculated considering P_i up to the i-th final pressure corresponding to 256. Remember that the imaginary number i is a number, not a variable, and thus should not use italic font, not even in equations.

Text, initials or units used in equations should also not use italic font, e.g.,

$$\text{density} = \frac{\text{mass}}{\text{volume}}, \qquad (3)$$

being the kilogram per cubic meter (kg/m^3) the unit of density in the SI system (International System of Units).

Units from the International System of Units (SI) should be adopted. When writing in Portuguese or Spanish, **use the comma decimal separator** in numbers, whether in text, tables, figures and/or graphics. In addition, make sure to use the same precision when comparing numbers, e.g.: 3.0 is different from 3.00 in terms of precision. However, it has same precision as 6.0. For texts written in English, it is up to the author whether to use dot or comma as the decimal separator (as long as the notations are not mixed). By writing a number and its unit[3], always maintain the number along with the corresponding unit, without a line break between them (in Ms Word, use Ctrl + Shift + Space, in LaTeX, insert a tilde ($\sim$) between number and unit). For instance, a distance of 3 m separate the entrance from the exit, or 4.512 cm is the measured distance.

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[3]Units always use non-italic font, e.g., 30 N/m^2.

3.7 Figures, tables and codes

Figures, tables and codes shall be inserted along the text, by preference following the citing paragraphs that should include a reference to the figures, tables, and codes respectively. Citation should be made before their actual presentation, for the reader's orientation. Interpretation of figures, tables and codes must be possible without reading the text itself. Figures and tables must be separated vertically from the text by a **single blank line** (12-pt). The LaTeX template provides this separation automatically.

Figures, tables and codes must be horizontally centralized and numbered sequentially (see the examples in Figure 1, 2 e 3; Table 1; and Code 1). They may be inserted in one or two columns depending on their content. In case of two columns, it is recommended positioning them in the top or bottom of the page. Try to use figures and graphs that present fully comprehensive content.

The figure's number and label, followed by the title should appear right below and centralized using 10-pt font. When content produced by other authors is used, even if adapted, indicate the source right after the descriptive title, as seen in the example given in Figure 1.

Numerations and titles of tables and codes must be placed above and centralized (see Table 1). The table reference source (when necessary) must be presented according to the original publication. Table 1 is presented as an example for

the style to be adopted. For the table's content a smaller font (smaller than 12-pt) can be used. Moreover, it is strongly recommended the use the automatic cross reference both in LATEX as in Ms Word. Remember that all objects, like figures and tables, must be mentioned in text.
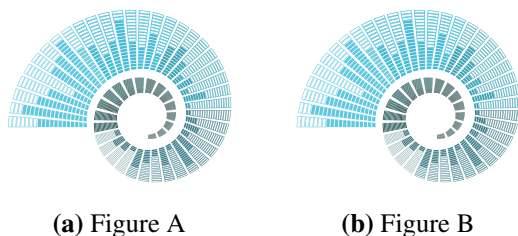

(a) Figure A   **(b)** Figure B
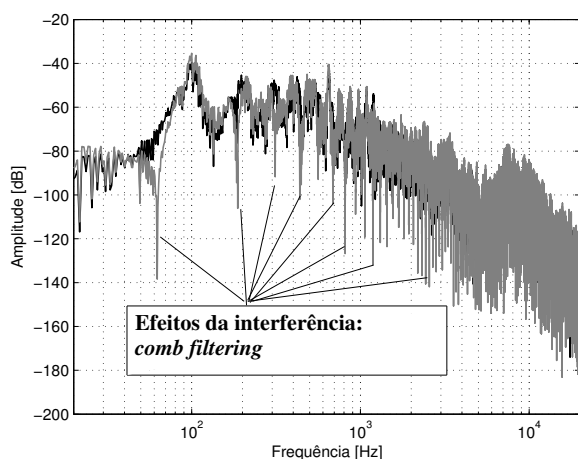
Figure 2: Side by side figures example.

Figure 3: C_{80} for distinct rooms. The figures can be inserted side by side (extracted from Brandão [3]).

It is recommended that graphs, figures and any graph objects are inserted in `.jpg` and/or `.png` format with good quality (or even in vector form in `.pdf` for LATEXusers). Make sure that graphic elements and figures are legible.

The distribution of this LATEX template includes the `Codes2Latex.sty` package[4], which allows

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[4]The package is still in development and no detailed documentation is available. Hence, for further details, examine the `sty` file.

generic code documentation for codes from languages such as Matlab, Fortran, Python, LabView, and LATEX itself in a organized form (see Code 1)

Código 1: Making Matlab Write Latex.

```
syms x
f = taylor(log(1+x));
latex(f)
```

All elements (figures and graphs, for example) can be colored or in gray scale. Avoid the use of text elements from other authors without proper citation (and/or authorization). It is essential that text in figures is using the same language as the article. Indirect citations like the ones used in Google images, for example, will not be accepted, just as it is recommended to avoid the use of volatile knowledge bases.

All figures, tables and codes must be cross-referenced, for instance: Figure 1 and Table 1. Note that the first letter is capitalized, because both the numbered figure as well as the numbered table is an object with a proper name . Also, the figure's or table's number should not be separated from the word Figure or Table to the next line. In Ms Word, use Ctrl + Shift + Space, and in LATEX, insert a tilde ($\sim$) between the word Figure and the command `\ref` or between the word Table and the command `\ref`.

For sub-figures, use Figure 2 (a), as an example.

4. ARTICLE TYPES

Manuscripts should be **original submissions** (that is, not yet published) of scientific research and applied engineering, architecture, audio, physics, mathematics, speech and hearing science and related fields and sub-fields. Thus, the following document types will be considered:

Table 1: CPA 1 e CAUQ-B porous layers microgeometric and macrogeometric properties [2]. Two-column table example.

Samples / Parameter	L_{p} [μm]	L_{a} [μm]	D_{p} [μm]	D_{a} [μm]	σ [Ns/m^4]	ϕ [−]	α_∞ [−]
CPA 1 - 3%	1359,81	1492,51	2344,05	1425,67	5131	0,218	1,63
CAUQ-B - 4,5%	1598,29	701,24	2126,46	895,34	54989	0,070	2,89

- **Technical and applied papers**: present original material based on known and/or developing techniques. Applied methods that are in accordance with regulations and/or present pertinent results must be presented. It is essential that they are of interest to researchers and professionals in the area.

- **Scientific papers**: contain original material (ideas, models, experiments, etc.) not published elsewhere, which substantially contribute to the scientific development. A relationship between the content and the already published *state of the art* must be established.

- **Review papers**: discuss the *state of the art* of the intended topic. This type of submission must aim for completeness, covering much of the already developed ideas, models, experiments, etc., even if they are in agreement with the author's opinion. It is important that the subject is of interest of the scientific community.

The thematic areas of the event include:

- General Acoustics;
- Environmental Acoustics;
- Speech and Hearing Acoustics;
- Room Acoustics;
- Building Acoustics;
- Musical Acoustics;
- Underwater Acoustics;
- Vehicle Acoustics;
- Virtual Acoustics;
- Aeroacoustics;
- Audio and Electroacoustics;
- Bioacoustics;
- Noise Control;
- Teaching in Acoustics;
- Acoustics and Vibration measurements;
- Legislation and Standardization in Acoustics;
- Acoustic materials;
- Numerical methods applied to Acoustics and Vibrations;
- Soundscapes;

- Signal Processing;
- Psychoacoustics;
- Noise and Vibration in the work environment;
- Ultrasound;
- Vibroacoustics and Vibration; and
- INAD and IYS2020.

5. ARRANGEMENT OF THE SECTIONS IN THE ARTICLE

The article structure should at least contemplate the following items:

- Introduction: introduction of the subject, definition of objectives, clarification of relevance.
- Fundamentals: especially in scientific articles, the main theoretical foundation required for proper understanding of the reminder of the article must be presented and referenced.
- Development: how the work was realized, including theory, materials and methodological details.
- Results and discussions: partial or conclusive, according to the type of work
- Conclusion or final considerations: based on the discussion and objectives, arguments or considerations that conclude the study/application mus be presented.
- Acknowledgments: optional, if pertinent.
- References: list of references that have been cited in the text.

There is no strict necessity to use the names proposed herein for the sections. The arrangement of the sections can be different, depending on the article's type. Other post-textual elements like appendices are optional, as long as the total number of pages of the article, including post-textual elements, do not exceed 12 pages.

5.1 Citations and references

A separate section named **References** must be inserted at the end of the document.

Both in the running text as well as in the reference list, all references should be **enumerated**

according to the order they appear in the text, using brackets [4]. All references listed must be cited in the text. No uncited references should be added to the list of references. The references given in the template [1–9] are only illustrative.

All entries in the list of references must be formatted in 10-pt Tomes New Roman font, simple spaced and 6-pt paragraph spacing. This LATEX template uses the `natbib` package for the arrangement and formatting of the references. Moreover, the use of bibliography database managers like JabRef, Mendeley and Zotero is recommended. Specially for Word users, Mendeley has a plugin that formats and inserts the references in the `.docx` document.

Depending on the context, the name of the author may or may not be written when citing in the running text, according to the following examples:

- "... Mareze et al. [7] worked in porous materials absorption..." or
- "... for the study of room acoustics [3], it is recommended the reading of a textbook..." or
- "... applying the Fourier transform to the input signals [5]. " or even
- "... Fonseca (2013) demonstrated the diffraction calculation for cylindrical surfaces [1]."

All authors appearing in the reference must be cited in text. For references with up to three authors, for example, Müller e Massarani [6], all authors must be cited (when evoked). In the case of more than three authors, for instance, Gomes et al. [4], only the first author's last name must be cited, followed the "et al. " expression. Still, by citing more than one reference, make use of just one bracket. Some examples are given as follows:

- "Works in Vibration and Acoustics subjects [1–3]."
- "Works in Acoustics subjects [2, 5–7]."
- "Works with statistical analysis [2, 3, 8]."
- **Avoid this style:** "Works with statistical analysis [2], [3], [9]."

Compacted and ordered references like [2, 5–7] are recommended.

In the reference section, whenever possible, include ISBN, ISSN, DOI[5] (with link) and/or link to the online address where the cited document is available.

6. SUBMISSION AND EVALUATION

After the submitted abstract has been approved, the authors will be invited to elaborate the complete work. Details about registration and full manuscript submission can be found on the website www.fia2022.com.br, or can be obtained with the organizing committee.

It is the author's responsibility to submit the articles in their final form, as the organizing committee will not proceed with further adjustments. For this reason, authors are requested to verify the article's formatting with attention, specially graphs and figures, regarding their legitimacy and digital (and print) quality. **The articles should be sent in PDF format (with maximum file size of 10 Mb)**.

The PDF metadata for LATEX users are automatically generated. Ms Word users must check during .docx to .pdf conversion.

Studies involving people (or living beings, in general), like in subjective acoustics or physiology, for instance, must inform the ethic committee approval term, if pertinent.

7. TEMPLATES FOR WORD AND LATEX

The LATEX template (`.tex`) was written in UTF8 encoding, thus being compatible with Windows, Mac, Linux and overleaf. It can be freely used for the article elaboration. We recommend LATEX users to access the template at Overleaf[6] and to create a copy to work on. On downloading the template and working offline with a local TEX distribution, additional packages or fonts might be required and must be downloaded ans installed.

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[5]For LaTeX users just provide the information in the "doi" field of the `.bib` file.

[6]https://www.overleaf.com/read/hgryywpgmxdx.

The author of the original template in Portuguese and models is professor William D'Andrea Fonseca, from Acoustical Engineering (EAC) of Federal University of Santa Maria (UFSM). The Ms Word version was created by Felipe Ramos de Mello (EAC/UFSM). Translation to English has been carried out by Thiago Morphy and professor Stephan Paul (UFSC).

All templates are available on the event website, Overleaf (PT-BR, SP and EN), and GitHub[7].

8. ACKNOWLEDGMENTS

If pertinent, make acknowledgments. In case of work with financial support, use this section to elucidate details.

In the case of this document, we would like to thank everyone for their cooperation with the event.

REFERENCES

[1] William D'A. Fonseca. *Beamforming considerando difração acústica em superfícies cilíndricas*. PhD thesis, Universidade Federal de Santa Catarina, Florianópolis, SC, 2013. URL http://www.bu.ufsc.br/teses/PEMC1445-T.pdf. ISBN 978-8591677405.

[2] Paulo H. Mareze, Guilherme Copetti, Eric Brandão, William D'A. Fonseca, Fernanda Dresch, and Luciano P. Specht. Modelagem da absorção acústica de camadas porosas asfálticas. In *XXVIII Encontro da Sociedade Brasileira de Acústica, Sobrac 2017*, Brasília, DF, 2017. URL https://bit.ly/Modelagem-da-absorcao-acustica-de-camadas-porosas-asfalticas.

[3] Eric Brandão. *Acústica de Salas: Projeto e Modelagem*. Blucher, São Paulo, 1 edition, 2016. ISBN 978-8521210061.

[4] Márcio H. A. Gomes, Paulo R. O. Bonifacio, Mário O. M. Carvalho, and Hilbeth P. Azikri. Vibro acoustic method for non destructive test of composite sandwich structures. *Applied Mechanics and Materials*, 751:153–158, 2015. ISSN 1662-7482. doi:10.4028/www.scientific.net/AMM.751.153.

[5] Alan Oppenheim and A. Simon Willsky. *Sinais e Sistemas*. Pearson, São Paulo, 2 edition, 2010. ISBN 978-8576055044.

[6] Swen Müller and Paulo Massarani. Transfer-function measurement with sweeps. *Journal of the Audio Engineering Society*, 49(6):443–471, 2001. ISSN 1549-4950. URL http://www.aes.org/e-lib/browse.cfm?elib=10189.

[7] Paulo H. Mareze, Eric Brandão, William D'A. Fonseca, Olavo M. Silva, and Arcanjo Lenzi. Modeling of acoustic porous material absorber using rigid multiple micro-ducts network: Validation of the proposed model. *Journal of Sound and Vibration*, 443:376 – 396, 2019. ISSN 0022-460X. doi:10.1016/j.jsv.2018.11.036.

[8] Joice Borges, Fernanda Pacheco, Bernardo Tutikian, and Maria Fernanda Oliveira. An experimental study on the use of waste aggregate for acoustic attenuation: EVA and rice husk composites for impact noise reduction. *Construction and Building Materials*, 161:501–508, 2018. ISSN 0950-0618. doi:10.1016/j.conbuildmat.2017.11.078.

[9] João Paulo Ristow, Samuel Pinson, William D'A. Fonseca, and Julio Cordioli. Utilização da integral de Kirchhoff-Helmholtz para simulação de dados de sonar de múltiplos feixes. *Acústica e Vibrações*, 31 (48):5–18, 2016. ISSN 1983-442X.

A. APPENDIX EXAMPLE

This is an appendix example. Additional information can be given here.

The LaTeX template has some additional commands that make writing easier, like, for instance, $\mathfrak{F}$ to symbolize the Fourier Transform. For a better understanding of the commands, consult the `FIA2020.sty` file.

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[7] https://github.com/willdfonseca/fia2020.