Preparing Your Conference Paper for Publication

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Preparing Your Conference Paper for Publication

- Why should I try to publish my conference paper?
- How should I start this process?
- What resources are available to help me?
- What if I’m not a good writer? Is it hopeless?!
- Where can I get information about improving my communication skills while I am at ASC 2018 in Seattle?
Why should I try to publish my ASC conference paper?

- Conference presentations initiate conversations among professionals about topics of shared interest.
- Subsequent publication of those presentations in Transactions furthers that conversation.
- Publication helps build your professional network.
How should I begin the process?

The best starting place is understanding the difference between a conference presentation and a paper suitable for publication in Transactions...

Sharing one example that made the journey from conference presentation to published paper on the ACS Conference website:

Organize technical content according to the needs of your audience.
A Novel Configuration for Superconducting Space Radiation Shields

Valerio Calvelli, Riccardo Musenich, Filippo Tunesi, and Roberto Battiston

Abstract—Long-time exposure to galactic cosmic rays is one of the most problematic threats for a manned mission in the deep space. In the last decades, several studies of active superconducting magnetic shields were performed leading to the proposals of apparently promising magnetic configurations. However, as the interaction of energetic particles with the materials composing the magnets was not taken into account, the contribution of secondary particles to the astronauts’ radiation dose was neglected, and, consequently, the actual effectiveness of the shields was overestimated. In the frame of the EU-FP7-SR2S project, a study of superconducting space radiation shield was performed associating the optimization of the magnetic configuration with Monte–Carlo simulation of the dose reduction. It was found that most of the magnetic shields proposed in previous works are not adequate, and a novel configuration, transparent to radiation, was proposed based on toroids arranged with their axes perpendicular to the spacecraft axis. Compared to other shields with the same shielding power, such a configuration results in lower magnetic field at the superconductor and very light design.

Index Terms—Superconducting magnets, space technology, cosmic rays.

Fig. 1. Three “classical” configurations for space radiation shielding. On the left, six solenoids surround the cabin (blue area); in the middle a co-axial toroidal configuration, on the right two concentric solenoids surround the habitat and compensate their magnetic fields inside the habitat itself.

is a valid alternative but requires huge superconducting magnets that have to operate in space for years. It would have been unthinkable 55 years ago when the magnetic shielding principle was first proposed [2], but now, thanks to the progress in magnet technology and to the development of high temperature superconductors as well as of magnesium diboride, active shielding has become a possible option.

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Don’t start your process with the abstract.

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• The published paper begins with an abstract and index terms.
• As an author, this should be the last component you write.
• By writing the abstract last, you will ensure that you have a clear understanding of your paper’s focus.
Use a “problem-solution” organization in the Introduction.

• The “problem-solution approach allows your reader to understand the context of the research you have conducted.
• The approach also gives you the opportunity to distinguish your work from previous efforts and to establish novelty, a key aspect of research.
Introduction--citing existing literature is required.

The existing literature reports several studies about magnetic shielding of space radiation, however until recent years all of them have based the evaluation of shielding efficiency only on the deflection by means of magnetic field, neglecting the interaction of particle with the materials composing the magnet. Materials act as passive shielding, stopping part of the incoming charged particles, however the interactions also generate secondary particle showers, which give an additional contribution to the astronauts’ radiation dose. A significant part of the secondary particles is neutrons, which cannot be magnetically shielded. Recent studies have shown that the particle-material interactions results in a reduction of the effective shielding power [3].

• Referring to existing literature is a sign that you have situated your own work in the context of the field.
• Unlike full research papers, however, you will not present a comprehensive literature review.
• Referring to previous work and providing citations is sufficient.
Technical Sections: consider how much information your audience needs in order to gain a good understanding of your work.

The novel configuration is based on a set of toroidal magnets positioned around the habitable module in such a way their axes are directed radially. It must be noted that the field of an ideal toroid is fully confined; therefore, a set of quasi-ideal toroids leaves many unshielded areas between them. In order to guarantee shielding all around the cabin the field must to be not confined, consequently the number of coils of each toroid has to be chosen low enough. After an optimization of the magnetic configuration, it was found that 3 coil toroids is the best solution. The number of toroids composing the shield depends on the maximum allowable dimension and on the spacecraft size. Fig. 3 shows a particular arrangement with 4 toroids, positioned at about 3.5 m from the spacecraft axis. Each toroid is composed by three coils, 120° apart (one of the coil lies on the xy plane, the others are symmetrically tilted by 60°). Despite its spread,

- The goal is not to provide a level of detail sufficient for others to reproduce your work.
- Instead, you are providing a high-level description of the many hours of painstaking effort you expended!
- The writers break the technical sections into Magnetic System and Mechanical Structure.
- Note the use of a figure to help promote understanding.
Technical Sections: be sure to use data-rich, visually compelling figures.

- In support of the paragraph we just reviewed, Figure 3 provides a clear visualization of the text description of the magnet system.

- In order to ensure that the audience understands the visual, be sure that the text and the visual are well integrated, e.g., that they are describing the same principles, actions, mechanisms.

Fig. 3. Magnet system surrounding the spacecraft habitat (gray cylinder). Part of the mechanical structure is not shown. Black arrows indicate the direction that the current should have to produce the shielding effect.
Technical Section: integration of text and visual assist the audience’s understanding.

In Fig. 4, the contour lines clearly show that the magnetic field is confined within the whole magnetic system and is spread all around the cabin. Due to the shape of the field, the new non-axial configuration was nicknamed “pumpkin configuration”.

Fig. 4. Magnetic flux density (10 mT) contour lines of the new configuration. The fringe magnetic field has a major role to cover the volumes outside the toroids, furnishing almost a $4\pi$ shield.
Conclusion and Abstract: these components finish and start the presentation of your work.

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• The conclusion is not simply a restatement of the introduction but a further invitation for others to join the conversation.

• Once you have written and revised the paper, you are ready to compose the abstract that reflects your content.
Helpful resources?

http://ascinc.org/publication/
Hiring help with editing can be a good investment.


https://ieeearchercenter.ieee.org/create-your-ieee-article/create-the-text-of-your-article/refining-the-use-of-english-in-your-article/
Another helpful resource is the IEEE PCS.
Style and Grammar

Proper style and correct grammar are essential to being taken seriously in engineering communication. Professional engineers need to write clearly and concisely, though a particular style might depend on the intended audience. Listed below are resources on style and grammar that can help you become more effective and efficient as writer.

Plain Language

It can be difficult to communicate complex or industry-specific content to a non-expert audience, which may lead to you not getting the results you expect. Use plain language to improve the effectiveness of your communication tasks.

Write Clearly and Concisely

Do you often have to verbally explain something you've written? You may not be writing clearly and concisely enough. Use this growing knowledge resource to learn how.
What if I’m not a good writer? Is it hopeless?!

Every writer can be a better writer!
Where can I get information on improving my communication skills at ASC 2018 in Seattle?


Date: Sunday, October 28, 2018
Time: 1:00 p.m. – 4:30 p.m.
Location: Sheraton Seattle Hotel – Room TBD
Cost: $25

Description: This course will provide professional guidance for preparing clear and well-stated abstracts and making effective presentations at technical conferences. The preparation of technical journal manuscripts that conform to the highest standards will also be addressed. The course is recommended for any student/researcher/scholar who would like to improve their communications skills. The course is being provided through the IEEE Professional Communications Society and is sponsored by the IEEE Council on Superconductivity.

Instructor:

Julia M. Williams (Rose-Hulman Institute of Technology)
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