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Preparing Your Conference Paper for Publication

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APPLIED SUPERCONDUCTIVITY CONFERENCE
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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?
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- 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?

Student Paper Awards at ASC 2016

- 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.

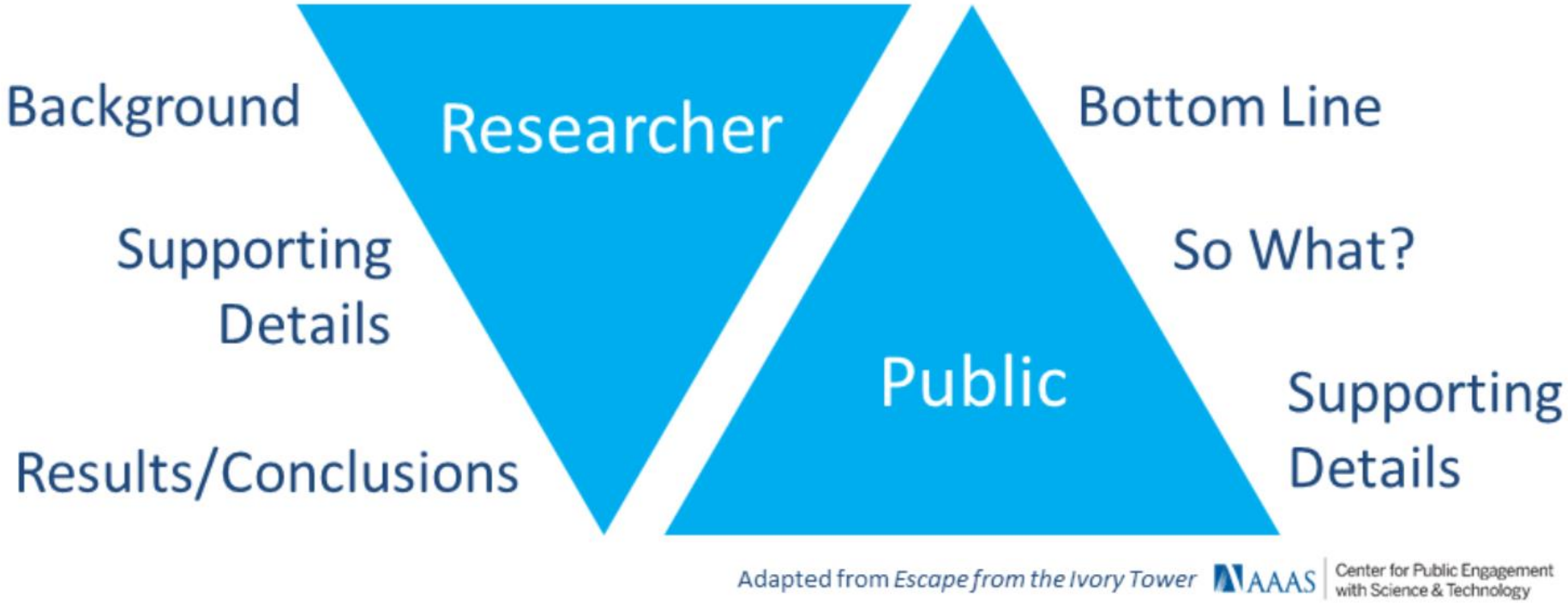
How should I begin the process?

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:

"A Novel Configuration for Superconducting Space Radiation Shields." V. Calvelli, R. Musenich, F. Tunesi, and R. Balliston. Transactions ASC, vol. 27, no. 4, June 2017.

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.**

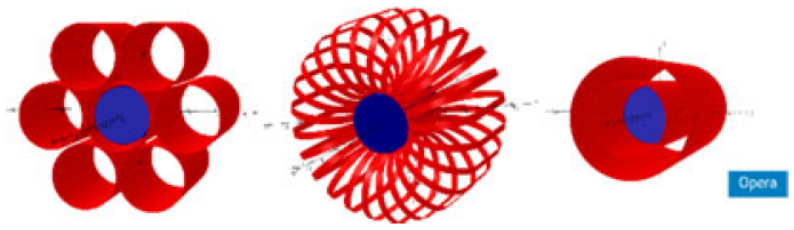


Fig. 1. Three "classical" configurations for space radiation shielding. On the left, six solenoids surround the cabin (blue area); in the middle a co-axial toroidal configuration, on the right two concentric solenoids surround the habitat and compensate their magnetic fields inside the habitat itself.

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.

The existing literature reports several studies about magnetic shielding of space radiation, however until recent years all of

Don’t start your process with the abstract.

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

- 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.

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Use a “problem-solution” organization in the Introduction.

I. Introduction

A WELL-KNOWN problem to face in the future, long-term, manned missions in deep space is ionizing radiation. Solar particle events (SPE) and Galactic Cosmic Rays (GCR) will threat the health of astronauts exposing them to several kinds of late and acute diseases, even fatal [1]. Several solutions have been proposed to protect crews, based on either energy loss in the interaction with matter (passive shielding) or the deflection of particles by means of magnetic fields (active shielding). Passive shielding requires thick layers of materials around the spacecraft cabin resulting in large mass increasing. Active shielding

- 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.

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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.

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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.

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Technical Sections: be sure to use data-rich, visually compelling figures.

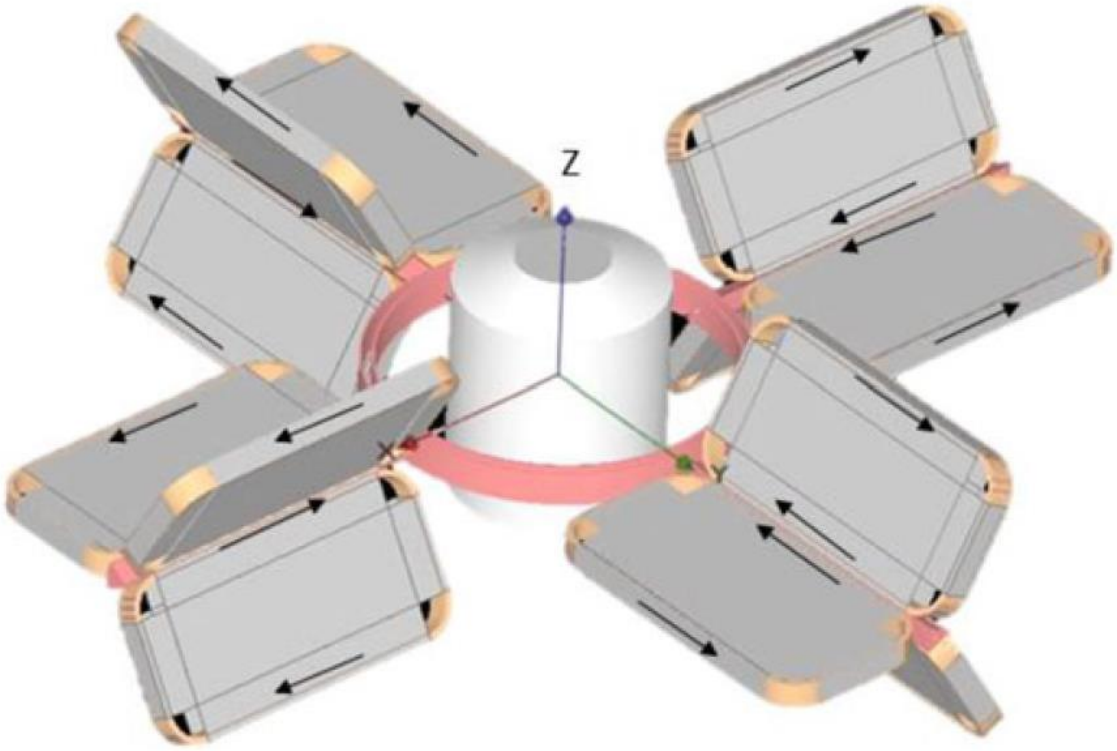

Fig. 3. Magnet system surrounding the spacecraft habitat (gray cylinder). Part of the mechanical structure is not shown. Black arrows indicate the direction that the current should have to produce the shielding effect.

- 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.

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Technical Section: integration of text and visual assist the audience's understanding.

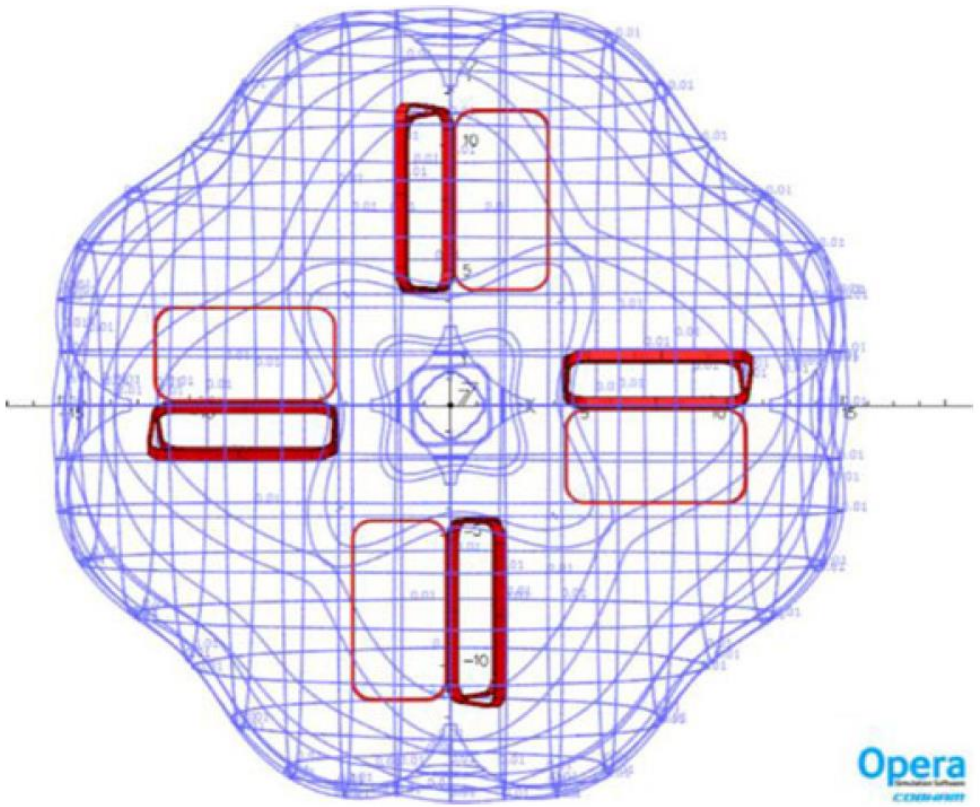

Fig. 4. Magnetic flux density (10 mT) contour lines of the new configuration. The fringe magnetic field has a major role to cover the volumes outside the toroids, furnishing almost a 4π shield.

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".

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Conclusion and Abstract: these components finish and start the presentation of your work.

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.

- 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.

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Helpful resources?

http://ascinc.org/publication/

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ASC 2018 > Publication

PUBLICATION

ASC 2018 offers the opportunity to publish selected, peer-reviewed papers submitted by conference attendees in a special issue of the IEEE Transactions on Applied Superconductivity (TAS), an archival, peer-reviewed, fully indexed and searchable journal published by the IEEE Council on Superconductivity. The publication process allows final manuscripts to be available on IEEE *Xplore* as early as 90 days after the conference, and most, if not all, accepted manuscripts will be available for download and citation prior to the scheduled August 2019 release of the entire Special Issue (vol. 29, no. 05). At the release date, a digital copy of the special issue will be delivered to conference attendees whose registration fee includes this item.

MANUSCRIPT SUBMISSION DEADLINE

Tuesday, October 30, 2108

PRESENTATION IS A REQUIREMENT FOR PUBLICATION

Authors presenting at ASC 2018 are not required to submit a manuscript. For authors that choose to submit a manuscript, only subject matter **presented at ASC 2018** will be considered for publication. This includes presentations in oral or poster format. The presentation should be given at the appointed time in the program, by the appointed author or co-author. Changes to the program, which have been approved by the ASC 2018 Program Chair, will be allowed for submitted manuscripts.

An abstract accepted for presentation at ASC may not lead to a published paper in TAS, click here for information in regards to the Scope of TAS.

MANUSCRIPT VALIDATION CODES

Manuscript submission is validated by a unique code. Only the Full Conference, Student and Retiree Participant registration fees include one (1) manuscript submission code. Other registration types do not include a manuscript submission code. Authors in these other categories must pay the standard TAS manuscript fee of US $440 to receive a registration code.

A code belonging to a co-author may be used by the submitting author to validate a manuscript. Multiple co-authors who choose to submit multiple manuscripts may also judiciously allocate codes provided by their registration fees. However, multiple use of a unique code will invalidate **all** submissions identified by that code.

Authors may submit multiple manuscripts provided that each submission is related to a presentation. If the author or a co-author cannot provide a manuscript code, additional codes can be obtained by paying the standard TAS manuscript fee of US $440 for each code required.

PAPER & PAGE LIMITS

Manuscript Type	Page Limit	Pages for References Only
Contributed Oral or Poster	4	+1 *
Invited Oral or Poster	6	+1 *
Plenary	12	no limit

*Page limits do not apply to References—***references may continue onto or entirely take up additional pages at no additional cost**.

The additional page fee is **$110** per page.

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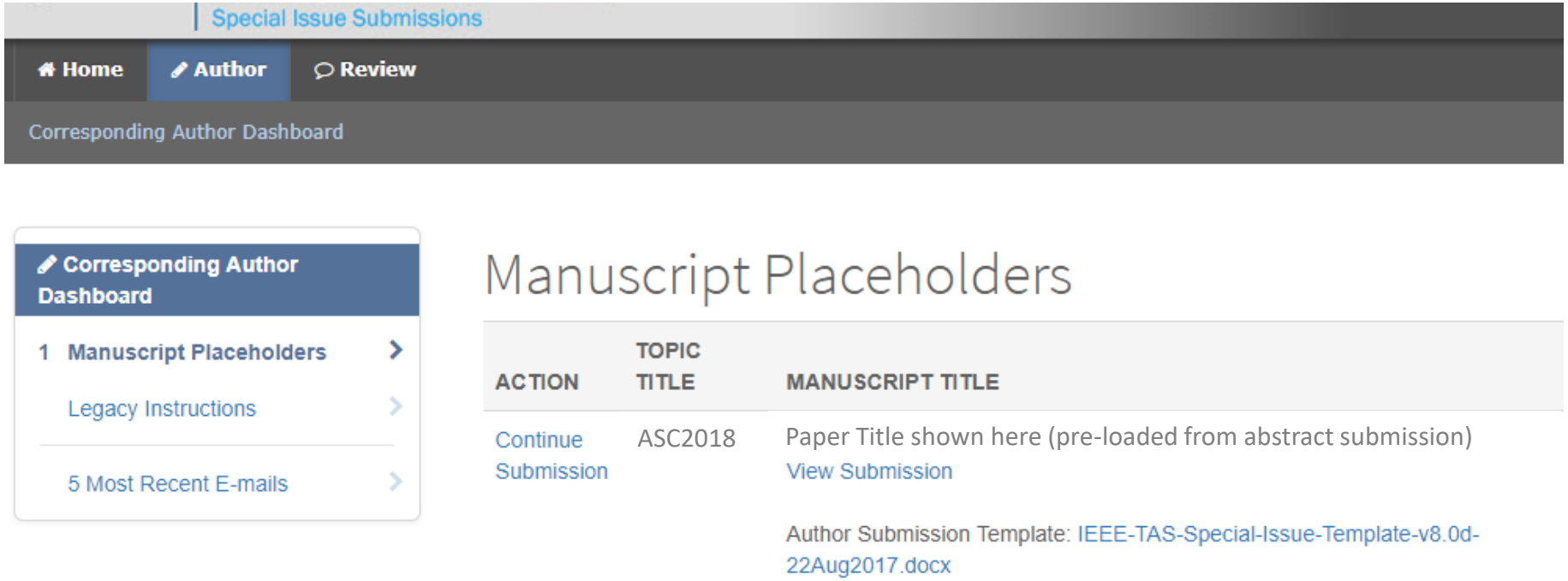
Hiring help with editing can be a good investment.



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https://ieeeauthorcenter.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.

IEEE Professional Communication Society pcs.ieee.org

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?

6. Effective Technical Presentations & Papers Educational – Half Day ***– sponsored by IEEE CSC***

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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