



IEEE Industry Applications Society Electric Machines Committee (EMC) 2023 Annual Meeting Minutes

Room 201AB, Music City Center, Nashville, Tennessee

Tuesday, 31st October 2023, 4:00 p.m. to 5:30 p.m.

Call to Order

EMC Chair Dr. Heins called the meeting to order at 4:00 p.m.

1. Attendance and New Members

Members were requested to register their attendance and interest in volunteering for ECCE 2024 via QR codes shown in the presentation or by writing their details on a sheet of paper that was made available. It was clarified that attendees must be IAS members to vote on EMC business.

To date, the roster on IEEE Listserv had 404 email addresses. A total of 8 new members joined over the previous year, 1 of which female. New members and members who joined over the past year were acknowledged.

2. Approval of the 2022 Meeting Minutes

The minutes of the 2022 meeting were circulated electronically prior to the meeting (9th of September 2023). A motion to accept the minutes was moved by Prof. Giulii Capponi and seconded by Prof. Marques Cardoso. The motion was carried unanimously.

3. Executive Reports

Transactions on Industry Applications/IAS Magazine EMC Papers Status Review - 2023

The Chair recognized and thanked current Associate Editors and reviewers for their service. The current Associate Editors are:

- | | |
|-------------------------------|---------------------|
| • Udochukwu Bola Akuru | South Africa |
| • Giulio De Donato | Italy |
| • Alireza Fatemi | USA |
| • Matthew Gardner | USA |
| • Konstantinos Gyftakis | Greece |
| • Min-Fu Hsieh | Taiwan |
| • Takashi Kosaka | Japan |
| • Antonio J. Marques Cardoso | Portugal |
| • Gianmario Pellegrino | Italy |
| • Ronghai Qu | China |



- Eric Severson USA
- Narges Taran USA
- Silvio Vaschetto Italy
- Rajeev Vyas USA
- Fan Wu USA
- Pinjia Zhang China

To replace outgoing Associate Editors and to add expertise in “high volume” areas, two new Associate Editors were appointed. The selection process was based on: a) ongoing work for the EMC as Track Chair at ECCE; b) performance as a reviewer for the EMC; c) expertise alignment with present needs. The 2 newly appointed AEs are highlighted in the list above **in bold** and were acknowledged by the Chair.

Submission and Decision Statistics

Over the last 12 months, the number of papers submitted was 374. The average first decision time for EMC manuscripts was 75 days, compared to 74 days for the prior year. The average final decision time was 174 days, compared to 157 days for the prior year. Out of the submitted EMC manuscripts over the last 12 months, the acceptance percentage was 0 % for the Magazine and 32.8% for the Transactions; the return-for-revision percentage was 50.4% and the rejection percentage was 16.8%. The average number of papers handled per AE was 24.93, well above the IAS average of 16.29. The Chair highlighted that the final decision time is high and will therefore increase the number of AEs. Furthermore, he intends sharing with AEs their own statistics compared to averages. Finally, he invited committee members to support the review process, since only about 40% of the invited reviewers over the last year agreed to review.

Process for Prospective Authors

The Chair described the process for prospective authors wishing to submit papers presented at an IAS sponsored conference for Transactions on Industry Applications/IAS Magazine:

- Members should fill in a form available at: <https://site.ieee.org/ias-emc/transactions-form/>.
- Upon manuscript submission, a cover letter should be included explaining the differences between the conference and journal versions.
- More information is available at: <http://sites.ieee.org/ias-emc/publications/>.

OJIA and JESTPE

The Chair illustrated the Open Journal of Industry Applications, owned by the IAS; its Impact Factor will be available at the end of the year. The standard Article Processing Charge for accepted papers is 1995 USD while IAS members get a 20% discount, i.e. 1596 USD. Special issues can be proposed by contacting Prof. Zanchetta.

The Chair also illustrated the Journal of Emerging and Selected Topics in Power Electronics, which is a joint IAS-PELS publication. IPCSD Technical Committees were asked to be more active in the proposal of Special Issues; the aim is to have 1 proposal every two years from each Technical Committee.

The Chair asked for feedback from the committee members and Prof. Ionel expressed doubts on the appeal of the name “Open Journal of Industry Applications”. Prof. Knight replied that the choice of the journal’s name was beyond the scope of the society.

ECCE 2023 Vice-Chairs’ Report

The Vice-Chair, Prof. Dutta, acknowledged and thanked Track G Topic Chairs for their work:

G01	Rajesh	Deodhar	IMRA Europe SAS, UK
G01	Yao	Duan	Toshiba Corp., USA
G01	Silvio	Vaschetto	Politecnico di Torino, Italy
G02	Nicola	Bianchi	University of Padova, Italy
G02	Hao	Ding	Rivian Automotive, USA
G02	Lavanya	Vadamodala	Altair Engineering Inc, USA
G03	Zhongze	Wu	Southeast University, China
G03	Lakshmi	Varaha Iyer	Magna International, Canada
G03	Maria	Martinez Gomez	University of Oviedo, Spain
G04	Udochukwu Bola	Akuru	Tshwane University of Technology, South Africa
G04	Roy	McCann	University of Arkansas, USA
G05	Matthew	Gardner	University of Texas-Dallas, USA
G06	Renato	Lyra	Aerotech Inc., USA
G06	Kyohei	Kiyota	Tokyo Institute of Technology, Japan
G07	Hassan	ELDeeb	SLPT Automotive, USA
G07	Jose	Antonino-Daviu	Universitat Politecnica de Valencia, Spain
G07	Konstantinos	Gyftakis	Technical University of Crete, Greece
G08	Adam	Skorek	University of Québec at Trois-Rivières, Canada
G08	Andrea	Cavagnino	Politecnico di Torino, Italy
G08	Rashmi	Prasad	General Motors, USA
G09	Fan	Wu	Rivian Automotive, USA
G09	Luigi	Alberti	Università di Padova, Italy
G10	Prerit	Pramod	Nexteer Automotive, USA
G10	Simone	Ferrari	Politecnico di Torino, Italy
G11	Avoki	Omekanda	General Motors, USA
G11	Hossein	Ehya	Norwegian University of Science and Technology, Norway
G12	Wolfgang	Gruber	Johannes Kepler University of Linz, Austria
G12	Eric	Severson	University of Wisconsin-Madison, USA
G13	Takashi	Kato	Nissan Motor Co., Japan
G13	Gerd	Bramerdorfer	Johannes Kepler University of Linz, Austria
G13	Alireza	Fatemi	General Motors, USA
G14	Athanasios	Karlis	Democritus University of Thrace, Greece
G14	Wei	Xu	Huazhong University of Science and Technology, China

The ECCE 2023 Track G Vice-Chairs were the EMC Vice-Chair, Prof. Rukmi Dutta, the EMC Secretary, Prof. Giulio De Donato, and Dr. Narges Taran.

ECCE 2023 Review Process

- Topic Chairs were selected from volunteers who expressed interest in the survey/attendance form at last year’s EMC meeting in Detroit.
- Track G01 General was dropped this year by the conference’s Technical Program Chairs
- Topic Chairs selected reviewers in the web system and assigned five reviewers for each digest.

- 95% of track G digests received more than 3 reviews. It was attempted to achieve 5 reviews for the majority of digests.
- Some reviewers did not provide evaluations even after the deadline. Their review assignments were cancelled, and Topic Chairs and Vice-Chairs worked on review evaluations.
- For the conference, **1071** reviewers reviewed **1585** submitted digests with an average of **4** reviews per paper.

EMC Level Statistics

- **224** digests submitted.
218(2022) 218(2021), 234(2020), 249(2019), 252(2018), 186(2017), 245(2016), 203(2015), 201(2014).
- **158** digests accepted
143(2022), 141(2021), 173(2020), 183(2019), 189(2018), 140(2017), 151(2016), 141(2015), 137(2014).
- Acceptance ratio: **70.5%**
69% (2022), 65% (2021), 74% (2020), 71% (2019), 75% (2018), 75% (2017), 62% (2016), 69% (2015), 68% (2014).

The electric machines sessions were:

- **15** oral sessions (18+4 remote sessions in 2022, 25 online in 2021, 21 online in 2020, 21 in 2019, 23 in 2018, 20 in 2017).
- **4** poster sessions.
- The ratio of sessions was similar to previous years, although the number of oral sessions was reduced this year by the conference organisers.

4. Subcommittees

The Chair illustrates the EMC Subcommittees and informs the members that both the Awards Subcommittee Chair and the Standards Subcommittee Chair positions are open for nominations. Interested members were invited to contact the Chair by email.

5. Awards Subcommittee Report

Member Recognitions

The following members were recognized for receiving IEEE awards:

- **Prof. Aldo Boglietti**
 - Recipient of the 2024 IEEE Nikola Tesla Award) “*for contributions to the magnetic and thermal modelling, design, and characterization of electrical machines.*”
- **Prof. Bilal Akin**
 - Elevated to IEEE Fellow (class of 2023) “*for contributions to control, diagnosis and condition monitoring of AC drives.*”

- **Prof. Marko Hinkkanen**
 - Elevated to IEEE Fellow (class of 2023) “for contributions to sensorless control of industrial motor drives.”
- **Prof. Yilmaz Sozer**
 - Elevated to IEEE Fellow (class of 2023) “for contributions to the design and control of electric machine drives.”

2023 EMC Transactions Prize Paper Awards (for papers published in TIA in 2022)

The Vice-Chair described the new department level initiative. Starting from this year, in addition to the IAS level Transactions Prize Paper awards, each Technical Committee assigns awards to its three best papers published in Transactions on Industry Applications during the prior calendar year.

The highest ranked papers from the original TIA review process were independently reviewed by the each of the 2023 EMC officers. The rankings were combined to determine the winning papers, which were:

- **First Prize**

“Different Approaches in the Use of Ferrites in Assisted Reluctance Machines”, by Emir Pošković, Luca Ferraris and Nicola Bianchi, Politecnico di Torino and University of Padua, Italy
- **Second Prize**

“Improving Combined Flow and Thermal Network Accuracy for Radially Air-Cooled Generators by Considering the Non-linear Resistance Characteristics of T-Junction Flow”, by Hui Wen, Yang Shi, Lijian Wu, Yidong Du and Youtong Fang, Zhejiang University, China.
- **Third Prize**

“Double Layer Capacitive Power and Heat Transfer in Rotating Machinery”, by Daniel Ludois, Kevin Frankforter, Sarah Behringer and Finn Roberts, University of Wisconsin-Madison, WI, USA.

2023 EMC ECCE Prize Paper Awards (for papers presented at ECCE 2022)

The EMC Vice-Chair described the selection process that was used for the ECCE prize paper awards:

- 6 top papers with the highest rankings from the digest-review process were selected for full review by the panel.
- The panel was formed by five distinguished reviewers: a balanced mix of industry (3) and academia (2), including previous committee chairs, prize paper award winners and subject matter experts:
 - Dr. Mircea Popescu
 - Prof. Nicola Bianchi
 - Dr. Haran Karmaker
 - Prof. Wen Soong
 - Dr. Rajeev Vyas

The winning papers were:

- **First Prize**

“Efficiency Improvement of Permanent Magnet Synchronous Machines With High Slot Fill Aluminum Winding”, by Yuto Yamada, Hiroya Sugimoto and Kazuhito Imae, Tokyo Denki University and Aster Co. Ltd., Japan.

- **Second Prize**

“Winding Losses in Coreless Axial Flux PM Machines with Wave and Spiral PCB Stator Topologies”, by Yaser Chulaee, Donovan Lewis, Greg Heins, Dean Patterson and Dan Ionel, University of Kentucky, KY, USA and Regal Rexnord, Australia.

- **Third Prize**

“EDM Damage Assessment and Lifetime Prediction of Motor Bearings Driven by PWM Inverters”, by Ryan Collin, Alex Yokochi, and Annette von Jouanne, Baylor University, TX, USA.

Recipients were recognized at the meeting and certificates were handed out.

Prof. Dutta then presented the call for nominations for Society Awards and recognitions for 2024.

Standards

Dr. Haran Karmaker is the outgoing Chair of the Standards Subcommittee. The slides were presented by Dr. Heins on behalf of Dr. Karmaker.

Project #1: IEEE P-11

“IEEE Std. 11: IEEE Standard for Rotating Electric Machinery for Rail and Road Vehicles”

- WG Chair: Tim Burress
- Current Version: 2006
- PAR Approved: March 2015, extended to December 2023, additional extension request.
- Seeking a new WG Chair (contact Tim Burress at burreستا@ornl.gov)
- On-going revision since June 2015.

Project #2: IEEE P-1812

“IEEE Std. 1812: IEEE Guide for Testing Permanent Magnet Machines”

- WG Chair: Yao Duan
- Trial-use guide published: 2014
- On-going revision since August 2016
- PAR extended until 2023
- Final approval obtained in 07/2023
- Currently under editor review to be published

Project #3: IEEE P-1415

“IEEE Std. 1415: Induction Machinery Maintenance Testing and Failure Analysis”

- WG Chair: Pinjia Zhang
- Current Version: 2006

- PAR Approved: 2019
- On-going revision since October 2019

Project #4: IEEE P-620

"IEEE Std. 1812: Guide for the Presentation of Thermal Limit Curves for Squirrel Cage Induction Machines"

- WG Chair: Yao Duan
- Current revision: 1996 (reconfirmed 2008)
- PAR submitted August 2019
- Final approval obtained in February 2022 and published in June 2022

Project #5: IEEE P-252

IEEE Standard Test Procedure for Polyphase Induction Motors Having Liquid in the Magnetic Gap

- PAR submitted 31st August 2018
- Final approval obtained in 12/2022 and published in 08/2023.

Project #6: IEEE P-114

IEEE Standard Test Procedure for Single-Phase Induction Motors

- PAR approved 26th September 2021
- WG Chair: Maher Al-Badri
- First WG meeting held on 26th October 2021
- On-going monthly WG meetings
- Interested members contact Maher Al-Badri albadri@ieee.org

6. IPCSD Diversity Equity and Inclusion Committee

Dr. Heins presented the newly created committee which had its kick-off meeting in May. The scope of the DEIC is to promote and enhance diversity, equity and inclusion practices within the IPCSD and its technical committees. Following the IEEE DEI guidelines, this committee will ensure that the IPCSD pursues its technical objectives using the talents and perspectives of people with different personal, cultural and disciplinary backgrounds. Prof. Giovanna Oriti is the Chair of the DEIC and the representative for the EMC is Dr. Xu Yang.

7. ECCE 2022 Session Chair Reports

The Session Chairs for ECCE 2023 were acknowledged by Prof. Dutta:

Oral sessions completed at the time of the EMC meeting

Session	Session Title	Session Chairs
S08	Induction Machines	Silvio Vaschetto and Md. Sariful Islam
S09	Electric Machines for Transportation	Alireza Fatemi and Gerd Bramerdorfer
S10	Diagnostics, Noise and Vibration in Electric Machines I	Hassan ELDeeb and Jose Antonino-Daviu
S31	Axial Flux Machines	Matthew Gardner and Giulio De Donato
S32	Modelling and Analysis of Electrical Machines I	Prerit Pramod and Andrea Cavagnino
S33	Materials, Losses, Thermal and Manufacturing Issues I	Ali Safayet and AK Arafat

Remaining sessions

Session	Session Title	Session Chairs
S43	Switched Reluctance and Flux Switching Machines	Roy McCann and Udochukwu B. Akuru
S44	Bearingless and High-Speed Machines	Eric Severson and Wolfgang Gruber
S52	IPM and Synchronous Reluctance Machines I	Nicola Bianchi and Gilsu Choi
S53	Additive Manufacturing in Electrical Machines	Luigi Alberti and Fan Wu
S63	Materials, Losses, Thermal and Manufacturing Issues II	Antonio Griffo and Sandro Rubino
S64	Wound Field and PM Machines I	Zhongze Wu and Lakshmi Varaha Iyer
S82	IPM and Synchronous Reluctance Machines II	Ramakrishnan Raja and Lavanya Vadamodala
S83	Modelling and Analysis of Electrical Machines II	Avoki Omekanda and Hossein Ehya
S94	Wound Field and PM Machines II	Shuvajit Das and Wei Xu

Session Chairs were invited to comment on the sessions they chaired. Dr. Fatemi described a good session S09 in terms of attendance, paper quality and active participation. He highlighted some issues related to video and audio equipment, namely a missing microphone for the attendees, the screen not visible from the presenters’ position and difficulty in using the presentation software. Prof. Antonino-Daviu described a good session S10 with fruitful discussions and an average attendance of 35-40 people. He confirmed Dr. Fatemi’s issues. Prof. Vaschetto informed the committee that the attendance at session S08 dropped to 10-15 people after the first presentation. Prof. De Donato described a well attended (65-70 people) session S31 and confirmed the issues described by Dr. Fatemi and Prof. Antonino-Daviu. Prof. Cavagnino described a good session S32 with an average of 45 attendees; he had the podium moved to the floor to allow the speakers to see their presentations on the screen. Dr. Heins informed the committee that EMC members would have been coordinating three special sessions on the future of electric machine design on Wednesday 1st and Thursday 2nd of November. He asked attendees to volunteer in taking brief notes and send them by email to Dr. Wung.

8. New Business

2024 Officers

Prof. Chiba, the Nominating Subcommittee Chair, announced the biennial role rotation of the Committee officers. In 2024, the Secretary will become Vice-Chair, the Vice-Chair will become Chair and the Chair will become Past Chair. The position of Secretary will become vacant, so the Committee should elect a new officer. Prof. Chiba then explained the Nominating Subcommittee guidelines and how it operated to propose Dr. Narges Taran as the candidate for the position of Secretary. Prof. Chiba then presented a brief overview of Dr. Taran’s career and of her contributions to the EMC. The motion to approve the new Secretary was proposed by Prof. Chiba, seconded by Prof. Giulii Capponi, and was carried unanimously.

Dr. Taran, via remote connection, spoke briefly to thank the Nominating Subcommittee and to accept her role.

Subsequently, the motion to approve the following slate of officers for 2024 was proposed by Prof. Chiba and seconded by Prof. Giulii Capponi. The motion was carried unanimously.

- Chair: Prof. Rukmi Dutta (rukmidutta@ieee.org)
- Vice-Chair: Prof. Giulio De Donato (giulio.dedonato@ieee.org)
- Secretary: Dr. Narges Taran (narges.taran@ieee.org)
- Past Chair: Dr. Greg Heins (gregheins@ieee.org)

ECCE 2024 – Preparation for ECCE 2024

Prof. Zanchetta presented ECCE 2024, which will be held in Phoenix, AZ, from the 20th to the 24th of October 2024. The digest submission deadline is scheduled for the 8th of March and the author notification for the 24th of May. Late breaking research briefs may be submitted until the 7th of June.

Other Upcoming Conferences

ICEM 2024

Prof. Pellegrino presented ICEM 2024, which will be held in Turin, Italy from the 1st to the 4th of September 2024 and will celebrate its 50th anniversary. The deadline for tutorials proposals and for full paper submission is the 1st of February 2024 and the author notification for the 1st of May 2024.

Nagamori Awards

Dr. Nishimura introduced the 10th Nagamori Awards and explained the application guideline. The application period goes from the 1st of November 2023 to the 31st of January 2024. More information can be found at <https://www.nidec.com/en/nagamori-f/awards/applicatioguidelines.html>. The awards ceremony will be held in person on the 8th of September 2024 in Kyoto, Japan. He then announced the winners of the 9th Nagamori Awards.

9. New EMC Website

Dr. Heins announced that the EMC website will migrate to a new site set up by IEEE in 2024. He asked Committee members for any banner images they were willing to share to embellish the new site. Images may be sent to Prof. De Donato via email.

10. Adjournment

A motion to adjourn the meeting was moved by the Chair and seconded by Prof. Akuru. The motion was carried unanimously.

Submitted by
Prof. Giulio De Donato
Secretary, IEEE IAS Electric Machines Committee
24th of December 2023