



IEEE Industry Applications Society Electric Machines Committee (EMC) 2022 Annual Meeting Minutes

Room 141 Huntington Place, Detroit, Michigan
Tuesday, 11th October 2022, 4:30 p.m. to 6:00 p.m.

Call to Order

EMC Chair Dr. Heins called the meeting to order at 4:30 p.m. Members were requested to register their attendance and interest in volunteering for ECCE 2023 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.

1. Memorial

Prof. Jahns gave a presentation on the life and career of Prof. Donald W. Novotny, who died on the 7th of May 2022. In addition to his many technical accomplishments, Prof. Novotny co-founded WEMPEC with Prof. Lipo in 1981 and served as its Co-Director for 25 years; he was a renowned teacher for more than 50 years at UW-Madison and an author of three influential textbooks in the fields of electromechanics, electric drives and electric machines; he was an avid fisherman and an expert in electrofishing; he served as the Chair of the EMC in 1986-87. A minute of silence was observed in honour of Prof. Novotny's memory.

Dr. Heins then showed a list of all the past EMC Chairs since the inception of the Committee in 1985.

2. Attendance

To date, the roster on IEEE Listserv had 391 email addresses. A total of 9 new members joined over the previous year, 6 of which female. New members and members who joined over the past year were asked to be acknowledged; Miss Graffeo from Politecnico di Torino, Italy, stood up and was welcomed by the Committee members.

3. Approval of the 2021 Meeting Minutes

The minutes of the 2021 meeting were circulated electronically prior to the meeting (26th of September 2022). A motion to accept the 2021 minutes was moved by Prof. Knight and seconded by Dr. Eldeeb. This motion was carried unanimously.

4. Awards

Member recognitions

The following members were recognized for receiving IEEE awards:

- **Prof. Thomas Jahns**
 - IEEE Medal in Power Engineering (2022) *“for contributions to the development of high-efficiency permanent magnet machines and drives.”*
- **Prof. Ayman EL-Refaie**
 - IEEE IAS IPCSD Gerald Kliman Innovator Award (2022) *“For innovative high-speed permanent magnet machines for transportation systems.”*
- **Prof. Gianmario Pellegrino**
 - Elevated to IEEE Fellow (class of 2022) *“for contributions to synchronous reluctance machines identification and control.”*
- **Prof. Bulent Sarlioglu**
 - Elevated to IEEE Fellow (class of 2022) *“for applications of electrical drives in the aerospace industry.”*

Prof. Sauer of University of Illinois at Urbana Champaign was also recognized for receiving the 2022 IEEE Nikola Tesla Award *“for contributions to dynamic modeling and simulation of synchronous generators and for leadership in power engineering education”*, but upon further verification after the meeting it was determined that he wasn’t a member of the EMC.

Awards outside of IEEE attributed to EMC members

The following members were recognized for receiving awards outside of IEEE:

- **Prof. Gianmario Pellegrino**
 - 8th Grand Nagamori Award by the Nagamori Foundation, Japan.

5. Executive Reports

Transactions on Industry Applications/IAS Magazine EMC Papers Status Review - 2022

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

To replace outgoing Associate Editors and to add expertise in “high volume” areas, four 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 and publication alignment with present needs.

The current Associate Editors are:

- | | |
|--------------------|-----------|
| • Giulio De Donato | Italy |
| • Yao Duan | USA |
| • Rukmi Dutta | Australia |
| • Min-Fu Hsieh | Taiwan |

- Takashi Kosaka Japan
- Leila Parsa USA
- Antonio J. Marques Cardoso Portugal
- Sanjib K. Panda Singapore
- Gianmario Pellegrino Italy
- Mircea Popescu UK
- Ronghai Qu China
- Eric Severson USA
- Adam Skorek Canada
- Silvio Vaschetto Italy
- Rajeev Vyas USA
- Katsumi Yamazaki Japan
- Pinjia Zhang China
- **Narges Taran USA**
- **Alireza Fatemi USA**
- **Konstantinos Gyftakis Greece**
- **Fan Wu USA**

The 4 newly appointed AEs are highlighted in the list above **in bold**.

Submission and decision statistics

Over the last 12 months, the number of original submissions was 191 and the average first decision time for EMC manuscripts was 74 days, compared to the all-time average of 71 days. The average final decision time was 157 days, compared to the all-time average of 138 days. Out of the submitted EMC manuscripts over the last 12 months, the acceptance percentage was 0.62% for the Magazine and 28.88% for the Transactions; the return-for-revision percentage was 55.9% and the rejection percentage was 14.6%. The Chair highlighted that the final decision time had become too long and would be shortened by reducing the extensions, which had been commonly granted due to the COVID-19 pandemic. Furthermore, he invited committee members to be more proactive for reviews, since only 43% of the invited reviewers over the last year agreed to review.

Process for prospective authors

The Chair described the new process for EMC members 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/>.

OAJIA and JESTPE

The Chair illustrated the Open Access Journal of Industry Applications, owned by the IAS, which is expected to have an Impact Factor around 3.75-3.87 by the end of the year. The standard Article Processing Charge for accepted papers is 1950 USD while IAS members get a 20% discount, i.e. 1560 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; one of these issues was recently put forward via the EMC by Prof. Bramerdorfer, “Machine Learning-Based Modelling, Design and Control of Electrical Machine and Drive Systems”.

ECCE 2022 Technical Program Vice-Chair’s Report

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

G01	Rajesh	Deodhar	IMRA Europe SAS, UK
G01	Peng	Han	Ansys Inc., USA
G02	Silvio	Vaschetto	Politecnico di Torino, Italy
G02	Yao	Duan	Toshiba Corp., USA
G03	Hao	Ding	Rivian Automotive, USA
G03	Nicola	Bianchi	University of Padova, Italy
G03	Narges	Taran	Ford Motor Company, USA
G04	Zhongze	Wu	Southeast University, China
G04	Takashi	Kato	Nissan Motor Co., Japan
G05	Udochukwu	Akuru	Tshwane University of Technology, South Africa
G05	Roy	McCann	University of Arkansas, USA
G05	Lavanya	Vadamodala	Altair Engineering Inc, USA
G06	Jian	Li	Huazhong University of Science and Technology, China
G07	Bryan	Ruddy	University of Auckland, New Zealand
G07	Renato	Lyra	Aerotech Inc., USA
G08	Jose	Antonino-Daviu	Universitat Politecnica de Valencia, Spain
G08	David	Reigosa	University of Oviedo, Spain
G08	Konstantinos	Gyftakis	Technical University of Crete, Greece
G09	Le	Chang	General Motors, USA
G09	Adam	Skorek	University of Québec at Trois-Rivières, Canada
G09	Alberto	Bellini	University of Bologna, Italy
G10	Fan	Wu	Rivian Automotive, USA
G10	Nick	Simpson	University of Bristol, UK
G10	Vandana	Rallabandi	GE Research, USA
G11	Prerit	Pramod	Nexteer Automotive, USA
G11	Luigi	Alberti	Università di Padova, Italy
G12	Matthew	Gardner	University of Texas-Dallas, USA
G12	Jonathan	Bird	Portland State University, USA
G13	Wolfgang	Gruber	Johannes Kepler University of Linz, Austria
G13	Eric	Severson	University of Wisconsin-Madison, USA
G13	Xuan (Melody)	Yi	GE Research, USA
G14	Gerd	Bramerdorfer	Johannes Kepler University of Linz, Austria
G14	Subrata	Saha	Aisin Corp., Japan
G14	Alireza	Fatemi	General Motors, USA
G15	Yi	Liu	Huazhong University of Science and Technology, China
G15	Athanasios	Karlis	Democritus University of Thrace, Greece

The ECCE 2022 Track G Vice-Chairs were the EMC Vice-Chair, Rukmi Dutta, the EMC Secretary, Giulio De Donato, and Antonio J. Marques Cardoso representing PELS TC3.

ECCE review process

- Topic Chairs were selected from volunteers who gave their names and preferred topics in an online survey sent to EMC members by email.
- Topic Chairs selected reviewers in the web system and assigned five reviewers for each digest.
- Five review evaluations were received for the vast majority of papers.
- 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, **1277** reviewers reviewed **1407** submitted digests with an average of **4.5** reviews per paper.

EMC level statistics:

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

It was reminded that the number of digests is higher in even years because IEMDC is held in odd years. The electric machines sessions recommended by the vice-chairs:

- 18 oral sessions (25 online in 2021, 21 online in 2020, 21 in 2019, 23 in 2018, 20 in 2017).
- 6 poster sessions.
- 4 remote sessions (new option included this year).
- All presentations (oral and poster) were pre-recorded.

6. Subcommittee Reports

Prize Paper Awards Presentation (for paper presented in ECCE 2021)

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 six distinguished reviewers: a balanced mix of industry (3) and academia (3), including previous committee chairs and prize paper award winners:
 - Prof. Akira Chiba
 - Prof Aldo Boglietti
 - Dr. Bruno Lequesne
 - Dr. Mircea Popescu
 - Prof. Nicola Bianchi
 - Dr. Haran Karmaker

The winning papers were:

- **First Prize**

"Flux Switching Permanent Magnet Motor with Metal Amorphous Nanocomposite Soft Magnetic Material and Rare Earth Free Permanent Magnets", by Satoru Simizu, Kevin Byerly, Kyle Schneider, Heonyoung Kim, Mark Nations, Sneha Narasimhan, Richard Beddingfield, Subhashish Bhattacharya and Michael McHenry, Carnegie Mellon University, Pittsburgh, PA, FREEDM Systems Center, North Carolina State University, NC, USA.

- **Second Prize**

"Rotor Reinforcement in High-Speed Motors by Polymer Composites", by Anthony Coppola and Alireza Fatemi, Global Research and Development Department, General Motors Company, Warren, MI, USA.

- **Third Prize**

"Additive Manufacturing of a Conformal Hybrid-Strand Concentrated Winding Topology for Minimal AC Loss in Electrical Machines", by Nick Simpson, Jakob Jung, Axel Helm and Phil H Mellor, Electrical Energy Management Group, University of Bristol, Bristol, UK and Additive Drives GmbH, Halsbrucke, Germany.

Recipients were recognized at the meeting and electronic certificates will be emailed to all the recipients.

Prof. Dutta then presented the call for nominations for Society Awards and recognitions for 2023. Prof. Knight invited the committee members to take a proactive approach towards Society Award nominations, particularly for the Distinguished Service Award.

Standards

Dr. Haran Karmaker is the Chair of the Standard subcommittee of EMC. The slides were presented by Prof. 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.
- Seeking a new WG Chair (contact Tim Burress at burresta@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: 2015
- On-going revision since August 2016
- Completed first ballot, approval rate reached, working on addressing comments.
- PAR extended until 2023

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
- Completed first ballot, approval rate reached, working on addressing comments
- Interested members contact Yao Duan yao.duan@ieee.org

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

Prof. Agamloh gave some additional information about standards development and informed the committee that the IPCSD was looking for more involvement by the technical committees, driven by industrial members and assisted by academic members. He invited interested committee members to volunteer as a replacement Chair for Std. 11.

Prof. Agamloh then gave a brief update on ECCE 2022, focussing on the virtual program of the conference which would start the following Monday 17th of October and encouraged active participation in it.

7. ECCE 2022 Session Chair Reports

The Session Chairs for ECCE 2022 were acknowledged:

Oral and poster sessions completed at the time of the EMC meeting

Session	Session Title	Session Chairs
S01	Axial Flux Machines I	Giulio De Donato and Narges Taran
S03	Induction Machines	Silvio Vaschetto
S14	Electric Machines for Transportation	Alireza Fatemi
S16	Diagnostics, Noise and Vibration in Electric Machines I	J. Antonino-Daviu and K. Gyftakis
S31	Permanent Magnet Machines	David Reigosa and Giacomo Scelba
S33	Materials, Losses, Thermal and Manufacturing Issues	Rafal Wrobel
S34	Thermal Issues in Electric Machines	Fabio Giulii Capponi and Rafal Wrobel
S36	Actuators and Non-Conventional Machines	Eric Severson and Fausto Stella
S52	Switched Reluctance and Flux Switching Machines I	Roy McCann and Luigi Alberti
S53	Materials, Losses and Thermal Issues	Navid Zargari
S61	Diagnostics, Noise and Vibration in Electric Machines	Luca Zarri
S62	Modelling and Analysis of Electric Machines in Specialized Applications	Silvio Vaschetto and Moinul Haque

Remaining sessions

Session	Session Title	Session Chairs
S64	Prof. Donald W. Novotny Memorial Session I	Tom Jahns and Bulent Sarlioglu
S66	Additive Manufacturing in Electrical Machines	Vandana Rallabandi
S76	Axial Flux Machines II	Greg Heins and Giulio De Donato
S78	Bearingless and High-Speed Machines	Wolfgang Gruber and Matthew Gardner
S88	Synchronous Reluctance Machines	Gianmario Pellegrino and Yves Perriard
S90	Diagnostics, Noise and Vibration in Electric Machines II	David Diaz Reigosa
S100	Interior Permanent Magnet Machines	Rukmi Dutta and Takashi Kato
S102	Switched Reluctance and Flux Switching Machines II	Lavanya Vadamodala and Roy McCann
S112	IPM and Synchronous Reluctance Machines	Luigi Alberti and Tom Jahns
S114	Switched Reluctance and Flux Switching Machines III	Lavanya Vadamodala and Roy McCann
S124	Design Optimization in Electric Machines	Simone Ferrari and Peng Han
S126	Wound Field and PM Machines	Ian Brown and Rukmi Dutta

Remote Q&A sessions (virtual program)

Session	Session Title	Session Chairs
R10	PM & Synchronous Reluctance Machine Design	Akira Chiba and Fabio Giulii Capponi
R20	Electric Machine Effects of Design and Operation	Athanasios Karlis and David Diaz Reigosa
R24	Design and Performance Assessment of Electric Machines A	Sandro Rubino and Jonathan Bird
R29	Design and Performance Assessment of Electric Machines B	Matthew Gardner and Emir Poskovic

Session Chairs were invited to comment on the sessions they chaired. Dr. Taran described a good S01 oral session with 70-80 attendees and highlighted some issues related to audio equipment, namely missing microphones for the Session Chairs. Prof. Vaschetto described a well-attended S03 oral session and a well-attended poster session S62, with plenty of discussions between the attendees and the presenters. Dr. Fatemi described a well-attended S14 oral session but highlighted that voices in the adjacent rooms were distinctly audible. Prof. Gyftakis described a well-attended oral session S16, with good participation and interest from the attendees. Prof. Reigosa talked about a well-attended poster session S31, with one paper not being presented. Dr. Wrobel reported well-attended and participated oral session S33 and poster session S33, commenting that it was a good idea to have pre-recorded videos. Prof. Severson described oral session S36 as well-attended and with good discussions. Prof. McCann reported a well-attended poster session S52, although the posters were condensed in a small space of the exposition area.

8. New Business

2022 Officers

The motion to approve the following slate of officers for 2023 was proposed by Prof. Knight (EMC Chair 2016-2017) and seconded by Prof. Severson. The motion was carried unanimously.

- Chair: Dr. Greg Heins (gregheins@ieee.org)
- Vice-Chair: Prof. Rukmi Dutta (rukmidutta@ieee.org)
- Secretary: Prof. Giulio De Donato (giulio.dedonato@ieee.org)
- Past Chair: Prof. Akira Chiba (chiba@ee.e.titech.ac.jp)

ECCE 2023 – Preparation for ECCE 2023

Dr. Foster presented ECCE 2023, which will be held in Nashville, TN, from the 29th of October to the 2nd of November 2023. The digest submission deadline is scheduled for the 19th of February and the author notification for the 15th of May. Among the novelties that were introduced is the 2 page Late Breaking Research Brief, which must be submitted by the 1st of June 2023.

A discussion followed. Dr Heins commented that there were doubts from the committee members regarding the briefs. Prof. Cavagnino asked for information on their review process and how the brief would be considered for presentation. Prof. Ojo, General Co-Chair of ECCE 2023, explained that accepted briefs would be presented as posters. Prof. Knight asked how these briefs would appear in the conference record and Prof. Ojo replied that they would appear as 2-page papers. Dr. Eldeeb enquired about possible submission to Transactions and Prof. Ojo answered that it would be possible, provided more results were added to the brief.

Dr. Foster concluded the presentation by asking the EMC to propose to the ECCE 2023 organization 3 candidates for conference Vice-Chairs for Track G.

Other Upcoming Conferences

IAS Annual Meeting 2025

Prof. Knight informed the Committee that in 2025 the IAS Annual Meeting will be held separately from ECCE 2025 and will be held either in IEEE Region 8 (Europe and Africa) or 10 (Asia). In order to engage with regional membership as well as regular attendees, the scope of the 2025 meeting will be the full scope of IAS. Therefore, it will be possible to submit papers falling within the scope of the IPCSD and the EMC. The IAS board put out a call for expressions of interest to host the Annual Meeting, with the deadline set to the 1st of December 2022.

IEEE International Electric Machines and Drives Conference (IEMDC) 2023

The Co-General Chair, Prof. Parsa, presented IEEE IEMDC 2023, which will be held in San Francisco, CA, from the 15th to the 18th of May 2023. The digest submission deadline is the 16th of December 2022. For more information, please visit www.iemdc.org.

IEEE Symposium on Diagnostics for Electrical Machines, Power Electronics and Drives (SDEMPED) 2023

The Co-General Chair, Prof. Gyftakis, presented IEEE SDEMPED 2023, which will be held in Chania, Greece, from the 28th to the 31st of August 2023. The paper submission deadline is the 15th of March 2023. For more information, please visit www.ieee-sdemped.org.



IEEE Workshop on Electrical Machines Design, Control and Diagnostics (WEMDCD) 2023

The Co-General Chair, Dr. Wrobel, presented IEEE WEMDCD 2023, which will be held in Newcastle upon Tyne, UK, from the 13th to the 14th of April 2023. The paper submission deadline is the 31st of December 2022. For more information, please visit wemdc2023.com.

IEEE International Conference on Energy Technologies for Future Grids (ETFG) 2023

Prof. Dutta spoke briefly about IEEE ETFG 2023, which will be held in Wollongong, Australia from the 3rd to the 6th of December 2023. The General Chair is Prof. K. Muttaqi and topics include “Electric Motors for Light and Heavy Electric Vehicles”. The paper submission deadline is the 1st of April 2023. For more information, please visit <https://attend.ieee.org/etfg-2023/>

Nagamori Awards

Dr. Nishimura introduced the 9th Nagamori Awards and explained the application guideline. The application period goes from the 1st of November 2022 to the 31st of January 2023. 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 3rd of September 2023 in Kyoto, Japan. He then announced the winners of the 8th Nagamori Awards, among which Prof. Pellegrino who also won the Grand Nagamori Award.

9. Adjournment

A motion to adjourn the meeting was moved by the Chair. The motion was carried unanimously.

Submitted by
Prof. Giulio De Donato
Secretary, IEEE IAS Electric Machines Committee
19th of November 2022