Commission GASS 2023 Report
Commission K

The Coordinating activities meetings for Commission K were held on Monday, Wednesday and Friday – August 21, 23 and 25, from 17:30 to 18:30 Sapporo time.
Prof. Koichi Ito, Chair of Commission K 2021-2023, led the first two meetings and turned over the last meeting to Francesca Apollonio, Chair for the 2023-2026 triennium. Part of the members was on site and part on-line, reaching however an adequate number of attendees close to 30 in average for the three meetings.

1. **Elections of Commission Officers**
Commission K held the election for Vice Chair during the 1st meeting. Two have been the nominations:
   - Lars Ole Fichte (Helmut Schmidt University, Germany)
   - Maxim Zhadobov (IETR / CNRS, France)

During the first CCA meeting the candidates presented shortly themselves. Election results were ratified at Council Meeting 2 on Tuesday, 22 August. 24 Official Members voted (first choice: 1 point, second choice: 2 points, ...).
We are pleased to announce that Lars Ole Fichte was elected Vice Chair of Commission K for the 2023-2026 triennium. We thank all the candidates for their generous offer to lead the Commission.

2. **Results of Election of Early Career Representative**
Commission K also held the election for Early Career Representative. Two young scientists were nominated including:
   - Kun Li (Japan)
   - Declan O’Loughlin (Ireland)

During the first CCA meeting the candidates presented shortly themselves. Election results were ratified at Council Meeting 2 on Tuesday, 22 August. 24 Official Members voted (first choice: 1 point, second choice: 2 points, ...).
We are pleased to announce that Kun Li was elected new Early Career Representative for the 2023-2026 triennium. We thank all the candidates for their generous offer to lead the Commission.

3. **Review of Terms of Reference**
After discussing at the 2nd Commission Coordinating Activities Meeting, we submitted the finalized updates on the Terms of Reference to the URSI Secretariat.
The final version in English is as follows:
Commission K is charged with promoting research and development in the following domains:
- Physical interaction of electromagnetic fields (from static to optical) with biological systems;
- Biological and health effects of electromagnetic fields;
- Effects of electromagnetic fields due to human activity on ecosystems, biodiversity, and planetary health;
- Biological mechanisms of the effects associated with exposure to electromagnetic fields;
- Electromagnetic exposure systems, dosimetry and tissue-equivalent models;
- Monitoring and assessing the exposure to electromagnetic fields;
- Diagnostic and therapeutic applications of electromagnetic fields;
- Healthcare and rehabilitative applications of electromagnetic fields.

The final version in French is as follows:
La Commission a pour tâche de promouvoir les recherches et les développements dans les domaines suivants:
- Interactions des champs électromagnétiques (des champs statiques au domaine optique) avec les systèmes biologiques au niveau de la physique;
- Effets biologiques et sur la santé des champs électromagnétiques;
- Effets des champs électromagnétiques générés par l’homme sur les écosystèmes, la biodiversité et la santé de la planète;
- Mécanismes à la base des effets biologiques des champs électromagnétiques;
- Systèmes expérimentaux d’exposition aux champs électromagnétiques, dosimétrie et modèles équivalents à des tissus;
- Suivi et évaluation de l’exposition aux champs électromagnétiques;
- Applications diagnostiques et thérapeutiques des champs électromagnétiques;
- Applications des champs électromagnétiques dans les soins de confort et la réadaptation physique et fonctionnelle.

4. Any changes/confirmation in Working Groups and other organizations
For the moment Commission K has not set up any Working Group, but at the last Coordinating Committee meeting of Saturday 26 August it has received an invitation by Comm B which decided the following:
Comm B would like to invite all commissions to create/discuss a joint working group on “5G/6G” (John Volakis and Ludger Klinkenbusch). Commission K is in favour of joining this WG.
5. **Technical Advisory Committee**

Commission K has defined in the past one Committee which helps the Officers in leading the activities of the Commission. This Committee is the Technical Advisory Committee (TAC) which is actually composed by the present Officers plus:

- Koichi Ito (Japan)  <immediate past Chair>
- Kensuke Sasaki (Japan)  <immediate past ECR>
- Michal Cifra (Czech Republic)
- Raquel Conceição (Portugal)
- Lourdes Farrugia (Malta)
- Lena Kranold (Switzerland)
- Niels Kuster (Switzerland)
- Alexandre Legros (Canada)
- Micaela Liberti (Italy)
- Lluis Mir (France)
- Puyan Mojabi (Canada)
- Azadeh Peyman (UK)
- Frank Prato (Canada)
- Masao Taki (Japan)
- Vijayalaxmi (USA)
- Jianqing Wang (Japan)
- Joe Wiart (France)
- Tongning Wu (China)
- Maxim Zhadobov (France)

6. **Preparation of Future Meetings/Identification of meetings to be supported (cfr. Commission budget)**

The Commission anticipates providing support to URSI centered meetings in the coming triennium. As funds permit, this includes young scientist support to attend the flagship meetings. Funds permitting, we may also support relevant conferences such as BioEM, the IEEE IMBioC, the IEEE AP-S/URSI.

7. **Report and comments on the scientific program of the Commission for the current GASS**

Commission K organized 17 scientific sessions, 4 joint sessions led by Commission K for a total of 154 papers submitted. Moreover, it organized a Tutorial inviting prof. A. Costanzo from Alma Mater Studiorum Università di Bologna, Italy on the topic “Energy-Autonomous Wearable Sensors for Biomedical Sensing”. The talk had a very good attendance.

The list of GASS sessions includes:
### List of the Joint Sessions

<table>
<thead>
<tr>
<th>day</th>
<th>session</th>
<th>Conveners</th>
<th>Chairs</th>
<th>Attendees</th>
</tr>
</thead>
<tbody>
<tr>
<td>21 Aug</td>
<td>KA</td>
<td>J Wiart, K Sasaki</td>
<td>J Wiart, K Sasaki</td>
<td></td>
</tr>
<tr>
<td>23 Aug</td>
<td>KB/1-2</td>
<td>P Mojabi, S Kidera, S Bojja Venkatakrishnan, E Topsakal</td>
<td>S Kidera, S Bojja Venkatakrishnan</td>
<td></td>
</tr>
<tr>
<td>24 Aug</td>
<td>KB/3</td>
<td>P Mojabi, S Kidera, S Bojja Venkatakrishnan, E Topsakal</td>
<td>S Kidera, S Bojja Venkatakrishnan</td>
<td></td>
</tr>
<tr>
<td>25 Aug</td>
<td>KD</td>
<td>L Mucchi, H Tanaka, D Anzai</td>
<td>H Tanaka, D Anzai</td>
<td></td>
</tr>
<tr>
<td>24 Aug</td>
<td>KE/1-2</td>
<td>J Wang, T Hikage, C Carobbi</td>
<td>W Jianqing</td>
<td></td>
</tr>
<tr>
<td>25 Aug</td>
<td>KE/3</td>
<td>J Wang, T Hikage, C Carobbi</td>
<td>W Jianqing</td>
<td></td>
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### 8. Proposed sessions and conveners for AT-RASC 2024

The first proposal for sessions for AT-RASC 2024 is as follows:

<table>
<thead>
<tr>
<th>Title</th>
<th>Proposed conveners</th>
</tr>
</thead>
<tbody>
<tr>
<td>K01 Biological effects and related exposure systems for RF/MMW EMF</td>
<td>TBD, L Fichte</td>
</tr>
<tr>
<td>K02 Monitoring molecular and cellular targets in bioelectromagnetics studies</td>
<td>M Cifra, L Caramazza</td>
</tr>
<tr>
<td>K03 Monitoring and manipulating cells and tissues with EM Fields</td>
<td>LM Mir, F Apollonio</td>
</tr>
<tr>
<td>K04 Characterization of dielectric and thermal parameters in tissues and cells</td>
<td>L Farrugia, E Porter, K Grenier</td>
</tr>
<tr>
<td>K05 Dosimetry &amp; Exposure Assessment</td>
<td>L Laakso, K Li, M Zhadobov, K Sasaki, G Sacco</td>
</tr>
<tr>
<td>K06 Monitoring EMF Exposure from emerging technologies</td>
<td>J Wiart, M Zhadobov</td>
</tr>
<tr>
<td>K07 EMF occupational assessment of exposure: measurements and numerical dosimetry</td>
<td>J Karpowicz, S D’Agostino, G Schenidt</td>
</tr>
<tr>
<td>K08 Biomedical applications of EMF</td>
<td>M Liberti, L Farrugia, R Conceição</td>
</tr>
<tr>
<td>K09 Non invasive for brain stimulation</td>
<td>M Colella, A Cassarà</td>
</tr>
<tr>
<td>K10 Healthcare and Rehabilitative Applications</td>
<td>K Ito, A Kioti, J Gomez-Tames</td>
</tr>
<tr>
<td>K11 Innovative EMF based biomedical applications</td>
<td>L Farrugia, L Caramazza, E Porter</td>
</tr>
<tr>
<td>K12 Open Session</td>
<td>Comm K Officers</td>
</tr>
</tbody>
</table>
The proposal for a Tutorial is the following:

<table>
<thead>
<tr>
<th>Index</th>
<th>Title</th>
<th>Proposed conveners</th>
</tr>
</thead>
<tbody>
<tr>
<td>KB</td>
<td>Electromagnetic Biomedical Imaging</td>
<td>P Mojabi, R Conceição, K Shouhei, E Porter</td>
</tr>
<tr>
<td>KD1</td>
<td>RF wearable devices for body area network: from numerical modeling to manufacturing</td>
<td>M Colella, G Paolini</td>
</tr>
<tr>
<td>KD2</td>
<td>Smart IoT for body area network</td>
<td>D Anzai, T Hiroshima</td>
</tr>
</tbody>
</table>

The proposal for a Tutorial is the following:

<table>
<thead>
<tr>
<th>Index</th>
<th>Title</th>
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</tr>
</thead>
<tbody>
<tr>
<td>K</td>
<td>Tolediagnostic and Telemedicine</td>
<td>L O Fichte, TBD</td>
</tr>
</tbody>
</table>

9. Contact information for new Commission K Officers (2023-2026)

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10. Other business
None