Report on the outcomes of a Virtual Mobility[1]

Action number: CA19110

Grantee name: Giulia Laghi

Virtual Mobility Details

Title: Electrical characterization of plasma sources used in the agri-food field

Start and end date: 30/09/2022 to 20/10/2022

Description of the work carried out during the VM

Description of the virtual collaboration and activities carried out during the VM, with focus on the work carried out by the grantee. Any deviations from the initial working plan shall also be described in this section.

(max. 500 words)

During the VM, **two instructional videos** focused on the electrical characterization of plasma sources relevant to the agri-food field have been realized. The **first video**, meant for electrical characterization-beginners (e.g. new researchers and non-plasma experts), explains in a clear and simple way the main aspects related to the electrical characterization of plasma sources. More in detail, this video includes:

- theoretical basic notions on electrical characterization;
- explanation of the main components of a typical electrical characterization set-up (i.e. plasma source, power supply, electronic probes, and oscilloscope);
- description of the main output which can be derived from electrical characterization (i.e. information from current and voltage waveforms and dissipated discharge power calculated by conventional and Lissajous methods).

This video has been realized by the grantee, with the support of the Research Group for Industrial Applications of Plasmas (IAP group) of the University of Bologna of which the grantee is a member. For the realization of this video, the grantee applied her competencies in electrical characterization acquired during her PhD program through research activities in Bologna and abroad. The support of the IAP group has been precious since all the members have consolidated experience in the field of the development and the electrical characterization of plasma sources at atmospheric pressure.

Link to the first video: https://youtu.be/zH6yAGJ2Y6Q

[1] This report is submitted by the grantee to the Action MC for approval and for claiming payment of the awarded grant. The Grant Awarding Coordinator coordinates the evaluation of this report on behalf of the Action MC and instructs the GH for payment of the Grant.

The **second video** provides an overview of the most used approaches in the COST Community for electrical characterization of plasma sources relevant to the agri-food field. To realize this video, contributions (in form of short videos) were asked to the COST members by means of an email. To help the participants in the realization of their contributions, some guidelines about the contents of the video have been reported in the email. More in detail, each video had to include:

- a brief explanation of a) the electrically characterized plasma source and its application in the agri-food field, b) the electrical characterization set-up, c) the main output of the electrical characterization and their link with the specific application;
- tips and recommendations for a successful electrical characterization.

Concerning what declared in the VM application, the maximum duration of the video contributions has been extended to 2 minutes (instead of 1) to offer to the participants the possibility to have sufficient time to properly explain their set-ups and tips for a successful characterization.

For the realization of this video, the grantee (with the support of the IAP group) has worked to collect the input from the COST participants and to process them (e.g. by adding subtitles).

Link to the second video: https://youtu.be/ZCxtifzZ6jY

Description of the VM main achievements and planned follow-up activities

Description and assessment of whether the VM achieved its planned goals and expected outcomes, including specific contribution to Action objective and deliverables, or publications resulting from the VM. Agreed plans for future follow-up collaborations shall also be described in this section.

(max. 500 words)

The main VM achievement is the realization of **two instructional videos** focused on the electrical characterization of plasma sources relevant to the agri-food field. Considering the importance of the electrical characterization in developing processes, evaluating plasma sources performances, and performing upscale, these videos will represent an interesting tool for the COST Community.

The **first video** provides theoretical notions and good practices for a proper electrical characterization and is meant for people who approach electrical characterization for the first time. By covering the main aspects of the electrical characterization of plasma sources relevant to the agri-food field, this video will help electrical characterization-beginners in performing successful electrical characterization and in managing in a more conscious way the output which can be obtained.

The **second video** offers an overview of the most used approaches in the COST Community for electrical characterization of plasma sources relevant to the agri-food field. This video was created by collecting contributions directly from the members of the COST Community. Contributions, asked through an email, were meant to show the most typical electrical characterization set-ups used in the COST Community. Despite the short time available, very interesting input have been collected and the reasons why the resulting video represents a useful instrument for the COST Community are numerous:

- it gives a more concrete perspective of what explained in the first video to electrical characterization-beginners;
- it offers the possibility to the COST members to share competencies and better knowing the existing facilities in the Community, thus encouraging the collaboration throughout the Community;
- it helps the COST Community in the definition of common standard procedures to properly acquire and compare data from electrical characterization set-ups;
- it provides visibility to various members of the COST Community and their laboratories;

- it can be used to create interest and raise awareness on electrical characterization among COST stakeholders with different backgrounds.

Since several COST members declared their interest in creating contributions on this topic but their impossibility to do that within the deadline, it cannot be excluded that another video which includes these contributions will follow this one.