



Newsletter No. 74

8th School on Pulsed Electric Field Applications in Food and Biotechnology

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The 8th School on Pulsed Electric Field Applications in Food and Biotechnology Electroporation took place from May 31 to June 3, 2022 in Compiègne (France), at the campus of the University of Technology of Compiègne (UTC). The aim of the School was to bring together undergraduate students, PhD students, academic and industrial researchers and to offer them an overview of the current knowledge and understanding of the basic principles involved in food processing and preservation by pulsed electric fields. Seventy-two participants, including the organizing committee members, from Europe and South America joined the School.

Each morning, lectures were given by renowned international experts from different countries (Austria, France, Germany, Ireland, Italy, Poland, Slovenia, Spain, Ukraine). Lectures were given by fifteen invited speakers (Prof. G. Ferrari, Prof. W. Frey, Prof. H. Jaeger, Prof. N.I. Lebovka, Prof. J. Lyng, Dr. S. Mahnic-Kalamiza, Prof. D. Miklavcic, Dr. O. Parniakov, Dr. G. Pataro, Prof. J. Raso, Prof. C. Rauh, Prof. R. Soliva-Fortuny, Prof. S. Toepfl, Prof. E. Vorobiev, Dr. A. Wiktr). The principal themes covered during these lectures were (1) the fundamentals of pulsed electric field, (2) the techniques and methodology to detect electroporation, (3) the effects of PEF in food processing, biotechnology and medical applications, (4) the practical aspects of PEF in the food industry, and (5) the PEF-implementation in the industry and the legislative considerations. Twenty-four students and young researchers were given the opportunity to present the results of their research in short five minute presentations. Six sponsors of the School (VITAVE, HVP, ELEA, EPS, Scandinova and Basis EP) also presented their companies in short five-minute presentations. These sponsors had also the possibility to present their company within their exhibition stands during coffee breaks.

Each afternoon, four parallel practical courses were organized in the laboratories of the Agro-industrials Technologies group and the Innovation Centre of the University of Technology of Compiègne. The practical course No. 1 untitled "Microbial inactivation using pulsed electric field" was conducted by Mohamed Koubaa and Sara Mitri, from UTC. In this practical course, the participants determined the residence time of a parallel electrode treatment chamber. Then, a suspension of molasses was treated in a continuous mode at different electric field intensities.

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Samples were drawn before and during the PEF treatments and were plated on a YPD culture medium. After incubating, the growing colonies were counted and a graph representing the log inactivation versus the field intensity was determined. The practical course No. 2 untitled "Improvement of the freezing efficiency of carrot discs by pulsed electric field" by conducted by Yuqi Huang and Olivier Bals, from UTC. In this practical course, the participants conducted a conventional freezing on a carrot disc from room temperature to -20°C. The freezing time from 2 to -6°C was calculated and verified according to given equation and process parameters. Then, a vacuum freezing and a PEF-pretreated vacuum freezing experiments was conducted during the same temperature range (2 to -6°C) and their freezing time was recorded, respectively. The parameters (temperature and air velocity) for a conventional freezing which give the same freezing time as vacuum freezing with or without PEF pre-treatment was predicted. The practical course No. 3 untitled "Modelling and simulation" was conducted by Justus Knappert from Technical University of Berlin. This practical course enabled the participants to implement a steady state CFD simulation of a PEF process within the software Ansys CFX. Therefore, theoretical basics were explained and step-by-step instructions through the graphical user interface were given. The practical course No. 4 was Vitave PEF system demonstration and was conducted by Jiri Dubjak and Hurem Vedran. This practical course showed the possible applications for PEF-treatment, in batch and continuous modes by using Vitave PEF-generator. Participants had the possibility to explore the advantages of using PEF-treatment on tomato peeling and on the texture of the treated product.

Finally, each evening, a rich social programme was organized to promote further interaction and networking among the attendants. The social program included a guided tour of the historic sites of Compiègne, a golf course playing initiation, a river cruise in Paris and a visit of the Compiègne city hall.

We thank all the sponsors (ELEA, VITAVE, HVP, Basis EP, EPS, ScandiNova, DIL, PulseMaster), as well as the industrial partners, the ISEBTT, and the University of Technology of Compiègne (Int. Relations Department) for their generous support. Sponsors represented an all-important enabling element for the School, not only making it possible, but also ensuring participation of more students and organisation of a rich scientific and social programme. Last but not least, the organizing committee would like to warmly thank all lecturers for sharing their knowledge and enabling a successful PEF School.

Forthcoming events

One-day PFA school: meet the electroporation experts

Barcelona, August 25, 2022

<https://tinyurl.com/1day-PFA-school>

4th World Congress on Electroporation and Pulsed Electric Fields in Biology, Medicine, and Food & Environmental Technologies

Copenhagen, October 9 – 13, 2022

<https://wc2022.electroporation.net>

16th interdisciplinary postgraduate course and international workshop Electroporation Based Technologies and Treatments (EBTT)

Ljubljana, November 13 – 19, 2022

<http://www.ebtt.org>

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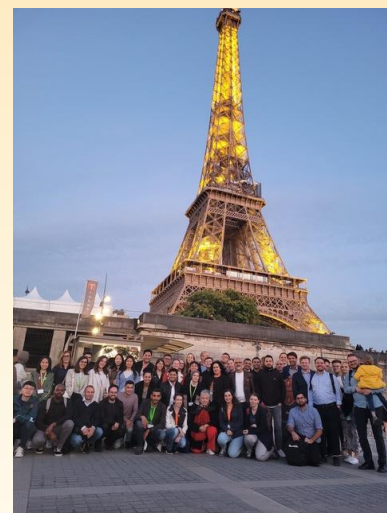
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A group photo with La Tour Eiffel in the background. A memory from the Wednesday trip to Paris featuring a boat ride on the Seine and dinner in a boat restaurant.

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