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Mr. Hong Xu



LETTER OF REFERENCE

Hong Xu, born April 5th, 1993, is working since December 1st, 2016 as PhD student in the Fuel Cell Systems and Diagnostics group of the Electrochemistry Laboratory within the Department of General Energy at PSI. He will defend his thesis on January 6th, 2021.

The topic of Hong Xu's PhD was the development of subsecond *operando* X-ray tomographic microscopy of polymer electrolyte fuel cells and its application to investigate the liquid water dynamics in the gas diffusion layer. Understanding the process of how liquid water accumulates in polymer electrolyte fuel cells is important to improve its efficiency, power density and to enable lower cost and commercial success. During his PhD Hong Xu has worked on the following topics:

- characterization of the limits of liquid water detection using X-ray tomographic microscopy as a function of scan time and pushing this limit based on advanced image processing by one order of magnitude.
- adaptation and testing of the imaging set-ups for X-ray tomographic microscopy.
- investigation of the water dynamics and water transport modes in *operando* cells using X-ray tomographic microscopy at the TOMCAT beamline at the Swiss Light Source.
- evaluation of the effect of liquid water accumulations on the electrochemical performance of polymer electrolyte fuel cells and its correlation to different pore morphologies.
- collaboration with industrial partners.

The work of Hong Xu is of high quality, in particular considering the multifaceted and demanding tasks ranging from fragile *operando* imaging cell preparation, electrochemical testing and characterization as well as compute cluster based image processing of TBs of image data. He is a creative and persistent person and is very skillful in the presentation and communication of data and complex scientific relationships. He has achieved a good publication record and was actively participating at international conferences.

It has always been a pleasure to collaborate and discuss with Hong on the professional as well as on the social level and he was very well integrated into the team. I wish him success for his future career.



Dr. Jens Eller
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