Contribution ID: **26**   Type: **not specified**

Multi-Dimensional Data Challenges in Neutron Imaging

Tuesday, 10 January 2017 11:30 (20 minutes)

4D imaging data might first be understood as time resolved 3D tomographic imaging data. However, this is not necessarily the most representative case in particular in neutron imaging. While neutron imaging despite low available phase space densities in neutron beams and the corresponding relatively long exposure times, does not only allow for kinetic studies in some limited cases even with 3D spatial resolution, it often produces different multi-dimensional data sets not even limited to 4D. These can only in some cases be reduced straight-forwardly especially in terms of dimensions for simplified visualization and analyses. The challenges of and current solutions for multidimensional neutron imaging data and their diversity in state-of-the-art neutron imaging as well as related to recent developments but apart from the conventional case of kinetic tomography studies shall be illustrated and discussed along some specific examples conveying:

(i) phase transitions in SOFC anodes under operation conditions: a time-of-flight (ToF) imaging study of reduction/oxidation kinetics in a moving sample with 2D spatial resolution

(ii) time and wavelength resolved modulated beam imaging e.g. of the setting process of dental cements

(iii) 3D neutron grain mapping and indexing –ToF tomography with multidimensional results

(iv) polarized neutron studies: from depolarization imaging to polarimetric ToF imaging and vector field reconstructions

(v) 4D through bi-modal imaging by combining x-ray and neutron tomographic data

(vi) micro-second time resolution in neutron imaging combining ToF and process kinetics resolution on the same time scale –the doubled time dimension in 2D imaging

Primary author: Prof. STROBL, Markus (ESS-ERIC)

Presenter: Prof. STROBL, Markus (ESS-ERIC)

Session Classification: Contributed talks Tuesday I

Track Classification: Lectures