

Modeling of Li-Ion-batteries to optimize the results gained by neutron imaging

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Monochromatic neutron beams or neutrons corresponding to a small wavelength band close to Bragg-edges are used to discriminate between different phases of materials or to gain a spatially resolved map of stress and strain inside a sample.

Standard neutron radiography and tomography experiments on the contrary are acquired with a white neutron beam most of the time. This is done in order to improve the neutron statistics of the recorded transmission images by the increased neutron flux reaching the sample or the detector, respectively.

In certain cases this may not yield the desired effects. It will be exemplified by measurements and calculations of the transmission through a Li-Ion-battery that a white neutron beam (thermal/cold) is not always the best choice for standard neutron radiography and tomography. A restricted band width of the neutron spectrum may not only give better results but also help to reduce the activation of the sample.

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