Contribution ID: **1** Type: **Poster**

Investigation of detector backlighting and other effects in neutron darkfield images

Tuesday 9 April 2024 18:30 (20 minutes)

Neutron imaging can provide unique contrast mechanisms. In order to yield reliable and reproducible attenuation coefficients for quantification, one needs to fully understand and characterize the experimental setup. One effect that has been largely overlooked in scintillator-camera based neutron imaging systems, is the backlight scattering or back illumination in the detection system itself, which can significantly affect the quantification of attenuation coefficients and can lead to severe errors and image artifacts. Herein, the backlighting effects are investigated by varying the illuminated detector area and the magnitude of the attenuation. The attenuation coefficient of multiple metal plates was determined by polychromatic neutrons at the CONRAD V7 instrument. We found that the strength of the back illumination effect strongly depends on the sample absorption. While it is relatively moderate (a few percent) for weak absorbing samples, it can be severe when the sample is a strong absorber (or when it is comparable thick).

Primary author: Dr AL-FALAHAT, Ala'a (Department of Mechanical Engineering, Faculty of Engineering, Mutah University, Al-Karak, Jordan)

Presenter: Dr AL-FALAHAT, Ala'a (Department of Mechanical Engineering, Faculty of Engineering, Mutah University, Al-Karak, Jordan)

Session Classification: Posters

Track Classification: MLC