



Contribution ID: 32

Type: **Invited talks**

SPHERES: the SPectrometer for High Energy RESolution at FRM II

Friday, 2 September 2016 11:55 (15 minutes)

SPHERES is a third-generation backscattering spectrometer with phase-transform chopper, located at a cold-neutron guide of FRM II, and in routine operation since 2007. For technical details, see [1,2,3]. In this talk, for a unique assembly of experts, I will not so much celebrate what we have achieved, but rather discuss the subtle difficulties that limit the accuracy of this fine experimental method. I will also highlight recent progress in modelling beam deflection by thick mosaic crystals [4].

[1] Wuttke et al, SPHERES, Jülich's high-flux neutron backscattering spectrometer at FRM II. *Rev. Sci. Instrum.* 83, 075109 (2012).

[2] Wuttke & Zamponi, Simulation-guided optimization of small-angle analyzer geometry in the neutron backscattering spectrometer SPHERES. *Rev. Sci. Instrum.* 84, 115108 (2013).

[3] Khanefit et al, Upgrading the Neutron Backscattering Spectrometer SPHERES. II. Faster Phase-Transform Chopper with Wider Deflector Mosaic. In preparation.

[4] Wuttke: Multiple Bragg reflection by a thick mosaic crystal. *Acta Cryst. A* 70, 429-440 (2014).

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Session Classification: Innovations in Backscattering