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Towards the development of polarization analysis with high energy resolution for SPHERES

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Neutron polarization analysis provides profound additions of knowledge to the field of soft condensed matter research. The ability to separate the coherent and incoherent scattering contributions gives information on spatial correlations and collective motion, and information from single particles, respectively.

In this study, we focus on upgrading the SPHERES (SPectrometer for High Energy RESolution) backscattering instrument at JCNS [1,2] to meet the demands for high energy resolution and polarization analysis. Because of geometry constraints the polarization analyzer would need to be located between the sample and the Si111 analyzers. Based on this design, we explore transmission wide angle polarizer supermirror analyzer option through Monte-Carlo simulations [3]. At this conference, we will present our work towards performing polarization analysis with the high-resolution capabilities at the SPHERES instrument.

[1] J.Wuttke, Rev. Sci. Instrum. 83, 075109 (2012)

[2] J.Wuttke, Rev. Sci. Instrum. 84, 115108 (2013)

[3] P. Böni, Nucl. Instrum. Methods Phys. Res. Sect. A 966, 163858 (2020)

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