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Polarized Neutron Capabilities of the HYSPEC spectrometer at SNS

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The HYSPEC spectrometer at the Spallation Neutron Source combines time-of-flight spectroscopy with focusing Bragg optics, facilitating both unpolarized and polarized neutron scattering experiments. Polarization analysis of scattered neutrons is achieved using a multi-channel array of 960 FeCoV-based supermirror polarizers, spanning 60 degrees horizontally and ± 7.5 degrees vertically. The sample region is highly configurable to support various polarization optics. An elevator/oscillator system allows for swift transitions between unpolarized, half-polarized, and full polarization analysis modes, enhancing flexibility and convenience. The current polarization capabilities at HYSPEC are demonstrated through recent polarized elastic and inelastic scattering studies on several magnetic materials. Particularly, I will showcase the results of a linear XYZ-polarization study on the antiferromagnetic and paramagnetic states of an MnO single crystal subjected to uniaxial pressure along the [110] crystallographic direction.

Primary author: GARLEA, Vasile Ovi (Neutron Scattering Division, Oak Ridge National Laboratory)

Presenter: GARLEA, Vasile Ovi (Neutron Scattering Division, Oak Ridge National Laboratory)

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