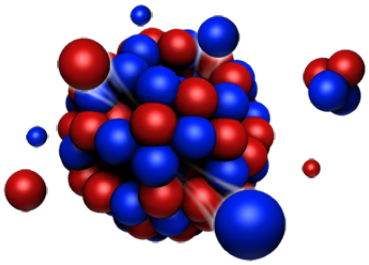

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Polarization Developments at the Direct Geometry Spectrometer HYSPEC

Tuesday 15 October 2019 15:20 (25 minutes)

HYSPEC is a direct geometry spectrometer at the Spallation Neutron Source, with optional polarization analysis. The region around the sample is sufficiently configurable to accommodate a variety of polarization optics. Several optics have been prototyped, tested and in some cases implemented as part of HYSPEC's user program. Instrument upgrades and testing which did not introduce new optics have improved the polarization analysis operations and effectiveness at HYSPEC. The first such improvement is an elevator / oscillator system, which for the first time enables rapid change (~10 minutes) from an unpolarized mode to a polarized mode of operation, introducing significant flexibility and convenience. The second improvement leverages a new portable detector platform that employs the same data acquisition systems employed for all SNS instruments. This platform is temporarily used to explore shielding configurations for the HYSPEC detector vessel, both to reduce the time-independent background and to both reduce and shorten the time-dependent prompt-pulse background. HYSPEC serves as a useful test platform for novel techniques, including the planned commissioning of a new spherical neutron polarimetry system ultimately intended for use on a triple axis spectrometer at the High Flux Isotope Reactor. Optics upgrades for HYSPEC have been built but not yet commissioned with neutrons, including a newly built RF flipper and a new and compact 3D coil system.

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