A New Instrument for Elastic/Inelastic Scattering Studies at a Long Pulsed Source

Low Energy Neutron Source

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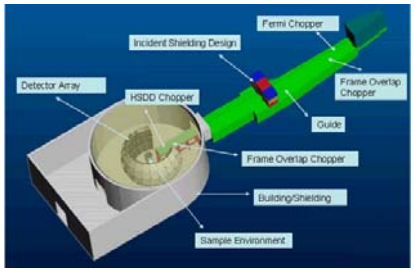
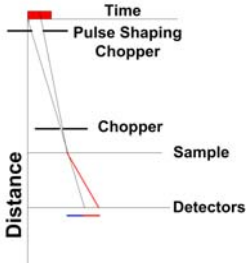
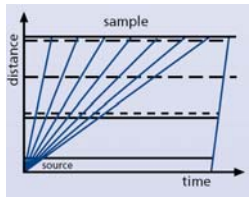
Spectrometers at short pulsed spallation sources base their determination of energy on the short initial pulse length. Long pulsed neutron sources, with milli-second length pulses, are being actively considered for the SNS and the ESS and new instrument concepts will be required. We describe a new instrument for elastic scattering that utilizes both time and wavelength multiplexing.

Short Pulsed Source Spectrometer



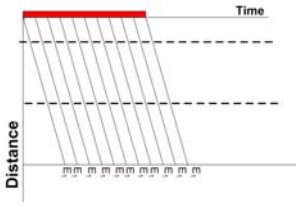


Long Pulsed Source Spectrometers

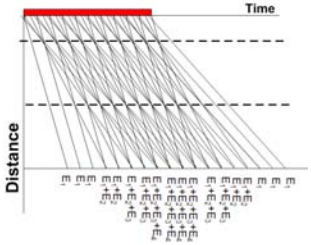


Long Pulse Options
1) Long Instrument using full pulse length
2) Short instrument using part of pulse
2a) Short instrument with Rep Rate Multiplication

Elastic Scattering Instrument

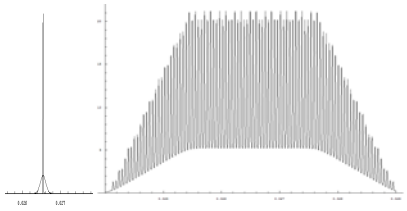


Time Multiplexing



Wavelength Multiplexing

Geometry of instrument ensures elastic scattering occurs in even spaced time intervals

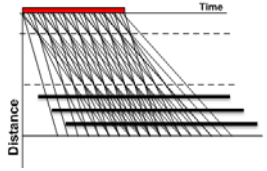


Simulated Scattering

Inelastic scattering provides a broad smooth background

Extraction of scattering intensities at different energies becomes a matrix inversion problem.

Incident flux associated with each peak can be individually determined



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