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MARS - A MULTI-ANGLE ROTOR SPECTROMETER FOR THE SNS

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Abstract

The design concept for an optimised direct geometry inelastic spectrometer on the SNS is discussed with the emphasis on the choice of the monochromating method. The resolutions, dynamic ranges and fluxes achievable with crystals and phased choppers are calculated for the incident energy range $20 \leqslant E_I$ (meV) $\leqslant 500$. We also consider the practicalities of realising a spectrometer to provide 1% energy transfer resolutions over a large (Q, ε) range. It is shown that the chopper spectrometer is the better choice for the major part of this incident energy range, but that the crystal method, particularly in a double monochromator arrangement, may offer advantages at the lowest energies. While anticipating that most applications will require the rotor option we consider that the most versatile spectrometer is a hybrid one, and make recommendations on a suitable spectrometer design. Full details of this work have been reported in Rutherford Appleton Laboratory report RAL-85-052.