

E0029

Opportunities for Fiber Diffraction with the Proposed Macromolecular Neutron Diffractometer MaNDi at the Spallation Neutron Source. Paul Langan, P. Thiyagarajan, A.J. Schultz, C. Rehm, J.P. Hodges, D.A. Myles, A.D. Mesecar, Bioscience Div. Los Alamos National Lab, Los Alamos, NM.

Neutron diffraction studies of fibers have made crucial contributions in a number of key scientific areas. These studies have been carried out on beam lines designed for small angle scattering, powder diffraction, membrane diffraction and macromolecular crystallography at reactor neutron sources throughout the world (including beam lines H3A and H3B at Brookhaven National Laboratory, D11, D16, D17 and D19 at the Institut Laue Langevin and HRPD and BIX3 at the Japanese Atomic Energy Research Institute). In order to exploit the high neutron flux that will become available beginning in 2006 at the Spallation Neutron Source (SNS), it is proposed to develop a high throughput and high resolution time-of-flight single crystal Macromolecular Neutron Diffractometer (MaNDi) at the SNS. The high throughput is accomplished by the use of a wide bandwidth of cold neutrons ($1.8\text{\AA} < \lambda < 4.5\text{\AA}$) sorted by time-of-flight and by an array of high-resolution position sensitive area detectors covering a large solid angle. The divergence of the incident neutron beam on MaNDi can be adjusted to match the resolution requirements of a given experiment. The high divergence, high flux arrangement will be ideal for fiber diffraction. It is expected that the unprecedented high data rates and resolution with MaNDi will open up new opportunities for neutron studies of partially ordered biological systems and biological polymers.

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