

Prospects for Neutron Diffraction under Extreme Pressure Conditions

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The Spallation Neutron Source currently under construction at Oak Ridge National Laboratory in the United States is due to receive first neutrons in the spring of 2006. In this talk the current state of the neutron instrument suite will be highlighted with particular emphasis on performance parameters of the diffraction instruments. The instrument parameters of the Spallation Neutrons And Pressure (SNAP) instrument will include a discussion of planned micro-diffraction capabilities. Specifically, recent progress in micro-focused neutron beams demonstrates that neutron diffraction from sub 100 micron samples held within 'more standard' opposed gem anvil cells (e.g. DACS) might be feasible. Beams focused to 90 x 90 microns have been demonstrated to produce at least an order of magnitude increase in flux at the focal spot. This technique does not significantly increase beam divergence. Recent neutron diffraction results from single crystal micro-samples (300 microns) mounted on fibers and micro samples (200 microns) under pressure in opposed gem anvil pressure cells will be presented.

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