## Abstract Submitted for the HAW05 Meeting of The American Physical Society

Demonstration of Thousands of Successive Bragg Reflections from a Perfect Silicon Crystal and Its Application in the Search for the Neutron EDM THOMAS DOMBECK, University of Hawaii, HELMUT KAISER, Indiana University, MICHAEL HUBER, Tulane University, DMITRY PUSHIN, Massachusetts Institute of Technology, DANIEL HUSSEY, DAVID JACOBSON, National Institute of Standards and Technology, ROBERT SMITHER, Argonne National Laboratory, DONALD KOETKE, Valparaiso University — Using neutrons from the National Institute of Standards and Technology reactor we have measured the reflectivity from the (220) planes of Si using multiple Bragg reflections from a channel-cut perfect crystal to obtain R=0.999949 with a rms error of 0.000017. This is in good agreement with model calculations and indicates that at least 20,000 reflections are possible before there is significant loss of neutron intensity. We are currently setting up to measure the neutron magnetic dipole moment (MDM) interaction with Si using multiple reflections of polarized neutrons. This interaction results in a rotation of the neutron spin due to the torque on the moving MDM in the atomic electric field. The spin rotations from multiple reflections will be additive yielding a measurable signal. One result of this experiment will be a measure of the atomic electric field experienced by the neutrons which is needed for an Electric Dipole Moment (EDM) search using this technique.

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