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Torsional oscillator and synchrotron x-ray experiments on solid helium in aerogel J. WEST, M.H.W. CHAN, Dept. of Physics, the Penn State University, University Park, Pennsylvania 16802, N. MULDERS, Dept. of Physics and Astronomy, University of Delaware, Newark, Delaware 19716, C.N. KODDITUWAKKU, C.L. BURNS, Dept. of Physics, Western Michigan University, Kalamazoo, Michigan 49008, L.B. LURIO, Dept. of Physics, Northern Illinois University, Dekalb, Illinois 60615 — A number of Torsional Oscillator experiments have shown that the Non Classical Rotational Inertia fraction in solid ^{4}He is strongly dependent on sample preparation. Samples presumed to be the most pristine show the smallest fraction, rapidly quenched samples a much larger one. On the assumption that samples grown in a strongly disordered environment would similarly show a large NCRIf, we have made T.O. measurements on solid samples grown in 95% porous silica aerogel. Contrary to expectation, these samples show a behavior that is very similar to high purity samples grown from the superfluid phase. Subsequent x-ray diffraction experiments show that the solid grown in aerogel is highly polycrystalline, with a hcp crystal structure (as in bulk) and a crystallite size of approximately 100 nm. X-ray diffraction experiments were performed at the Advanced Photon Source, Argonne national laboratory. This work was supported through NSF DMR-0706339 (MHWC) and DE-FG01-05ER05-02 (CAB).

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