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Observation of the Larkin-Imry-Ma Effect in Superfluid ^{3}He-A in Aerogel[1] J.I.A. LI, Northwestern University, J. POLLANEN, California Institute of Technology, A.M. ZIMMERMAN, C.A. COLLETT, W.J. GANNON, W.P. HALPERIN, Northwestern University — It was proposed by Volovik that ^{3}He-A in aerogel will be a superfluid glass owing to the Larkin-Imry-Ma (LIM) effect where arbitrarily small amounts of disorder can disrupt long range directional coherence of a vector order parameter in a condensed system. Several reports of NMR experiments in ^{3}He-A have been interpreted as evidence for this phenomenon. However it is not trivial to distinguish the LIM effect induced from disorder on a microscopic scale from macroscopic non-uniformity or anisotropy in the aerogel sample. Order parameter disorder from these two possible mechanisms have very different distributions of order parameter orientations directly observable in the width of the NMR spectrum. If a complete LIM effect is operative there should be no contribution to the line width, contrary to previous reports. On warming from the low temperature isotropic state, we find NMR spectrum shifts characteristic of the dipole-locked axial state, i.e. no sign of a LIM superfluid glass. However, on cooling from the normal state this same phase is fully disordered in a LIM state. We will discuss the origin of the different order parameter structures in superfluid ^{3}He-A that result when prepared from the normal state, as compared with warming from the B-phase.

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