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The glassy response of torsion oscillators of solid ^{4}He[1] MATTHIAS J. GRAF, LANL, ZOHAR NUSSINOV, WUSTL, ALEXANDER V. BALATSKY, LANL — We have calculated the glassy response of a torsional oscillator filled with solid ^{4}He assuming a phenomenological glass model. Making only a few assumptions about the distribution of glassy relaxation times in a small subsystem of otherwise rigid solid ^{4}He, we can account for the bulk of the magnitude of the observed period shift and dissipation peak as reported in several torsion oscillator experiments. The glass model places stringent constraints on dynamic and thermodynamic responses of solid ^{4}He and the magnitude of a possible supersolid phase. We also discuss the implications for a superglass state proposed recently by the Cornell group.

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