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Properties and Detection of Spin Nematic Order in Strongly Correlated Electron Systems DANIEL PODOLSKY, Physics Department, UC Berkeley, EUGENE DEMLER, Physics Department, Harvard University — A spin nematic is a state which breaks spin SU(2) symmetry while preserving translational and time reversal symmetries. Spin nematic order can arise naturally from charge fluctuations of a spin stripe state. Focusing on the possible existence of such a state in strongly correlated electron systems, we build a nematic wave function starting from a $t-J$ type model. The nematic is a spin-two operator, and therefore does not couple directly to neutrons. However, we show that neutron scattering and Knight shift experiments can detect the spin anisotropy of electrons moving in a nematic background. We find the mean field phase diagram for the nematic taking into account spin-orbit effects. [cond-mat/0411159].

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