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Bicollinear Antiferromagnetic Order, Monoclinic Distortion, and Reversed Resistivity Anisotropy in FeTe as a Result of Spin-Lattice Coupling[1] CHRISTOPHER BISHOP, ADRIANA MOREO, ELBIO DAGOTTO, University of Tennessee, Knoxville and Oak Ridge National Laboratory — The bicollinear antiferromagnetic order experimentally observed in FeTe is shown to be stabilized by the coupling $\tilde{g}_{12}$ between monoclinic lattice distortions and the spin-nematic order parameter with B_{2g} symmetry, within a three-orbital spin-fermion model studied with Monte Carlo techniques [1]. A finite but small value of $\tilde{g}_{12}$ is required, with a concomitant lattice distortion compatible with experiments, and a tetragonal-monoclinic transition strongly first order. Remarkably, the bicollinear state found here displays a planar resistivity with the "reversed" puzzling anisotropy discovered in transport experiments. Orthorhombic distortions are also incorporated and phase diagrams interpolating between pnictides and chalcogenides are presented. We conclude that the spin-lattice coupling we introduce is sufficient to explain the challenging properties of FeTe. [1] C.B Bishop et al., Phys. Rev. Lett. 117, 117201 (2016).

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