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**Nematic state of the pnictides stabilized by the interplay of the lattice with the spin and orbital degrees of freedom** SHUHUA LIANG, ADRIANA MOREO, ELBIO DAGOTTO, Department of Physics, University of Tennessee and Materials Science and Technology Division, ORNL — The nematic state of the iron-based superconductors is studied in the undoped limit of the three-orbital (xz, yz, xy) spin-fermion model [1] via the introduction of lattice degrees of freedom. Monte Carlo simulations show that in order to stabilize the experimentally observed lattice distortion and nematic order, and to reproduce photoemission experiments, both the spin-lattice and orbital-lattice couplings are needed. The interplay between their respective coupling strengths regulates the separation between the structural and Neél transition temperatures. Experimental results for the temperature dependence of the resistivity anisotropy and the angle-resolved photoemission orbital spectral weight are reproduced by the present numerical simulations [2].

[1] S. Liang, G. Alvarez, C. Sen, A. Moreo, and E. Dagotto, Phys. Rev. Lett. 109 047001 (2012)
[2] S. Liang, A. Moreo, and E. Dagotto, Phys. Rev. Lett. 111 047004 (2013)

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