

Abstract Submitted
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EuB₆ and the Low-Density Double Exchange Model¹ VITOR M. PEREIRA, J.M.B. LOPES DOS SANTOS, CFP and Departamento de Física, Faculdade de Ciências Universidade do Porto, 4169-007 Porto, Portugal, ANTONIO H. CASTO NETO, Department of Physics, Boston University, 590 Commonwealth Avenue, Boston, Massachusetts 02215, USA — The low electronic density regime of the double exchange model is explored in the presence of electron-electron interactions. The single particle problem and its extension to low densities, when a Wigner crystal of magnetic polarons is generated due to unscreened Coulomb interactions, is studied. It is argued that the Wigner crystal is the natural alternative to phase separation when the Coulomb interaction is taken into account. We address the thermal and quantum stability of the crystalline phase towards a polaronic Fermi liquid and a homogeneous, metallic, ferromagnetic phase. These results are relevant in the context of the polaronic physics recently observed in EuB₆, and provide an important consistency-check for the double-exchange description of these magnetic hexaborides.

References:

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V. M. Pereira *et al.*, Phys. Rev. Lett. **93**, 147202 (2004).

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