

Excitonic condensation of strongly correlated electrons

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Competition of several atomic multiplets in materials with strongly correlated electrons, e.g., close to a spin-state transition, may result in an instability towards long-range ordering. We have investigated the minimal model exhibiting such behavior, the two-band Hubbard model[1, 2]. Besides a conventional high-spin–low-spin checker-board order we found a behavior that can be described as a condensation of spinful excitons. We will discuss the physics of the excitonic condensation and present results obtained with the dynamical mean-field theory. We will also briefly mention the excitonic solutions we have obtained with LDA+U for real materials and point out the rich physics arising from orbital degeneracy in these systems.

- [1] J. Kuneš and P. Augustinský, Phys. Rev. B **89**, 115134 (2014).
- [2] J. Kuneš and P. Augustinský, arXiv:14505.1191.