Strong correlations and the search for high-Tc superconductivity in chromium pnictides and chalcogenides\textsuperscript{1} ELENA BASCONES, MARIA JOSE CALDERÓN, JOSE MARIA PIZARRO, Instituto de Ciencia de Materiales de Madrid (ICMM-CSIC), JIAN LIU, Instituto de Ciencia de Materiales de Madrid (ICMM-CSIC) and Shandong University, MARIA DEL CARMEN MUÑOZ, Instituto de Ciencia de Materiales de Madrid (ICMM-CSIC) — Undoped iron superconductors accommodate \(n = 6\) electrons in five d-orbitals. Experimental and theoretical evidence shows that the strength of correlations increases with hole-doping, as the electronic filling approaches half-filling with \(n = 5\) electrons. This evidence delineates a scenario in which the parent compound of iron superconductors is the half-filled system, in analogy to cuprate superconductors. In cuprates the superconductivity can be induced upon electron or hole doping. In this work we propose to search for high-Tc superconductivity and strong correlations in chromium pnictides and chalcogenides with \(n < 5\) electrons. By means of ab-initio, slave spin and multi-orbital RPA calculations we analyse the strength of the correlations and the superconducting and magnetic instabilities in these systems with main focus on LaCrAsO. We find that electron-doped LaCrAsO is a strongly correlated system with competing magnetic interactions, being \((\pi, \pi)\) antiferromagnetism and nodal d-wave pairing the most plausible magnetic and superconducting instabilities, respectively.

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