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Competing magnetic double-Q phases in iron pnictides MARIA N. GASTIASORO, BRIAN M. ANDERSEN, Niels Bohr Institute — Recent experimental studies have reported several unusual properties in the magnetic phase of iron pnictides compatible with double-Q magnetic phases in a tetragonal crystal. Here we perform a theoretical study of the stability and electronic properties of the relevant double-Q phases of these compounds. The model consists of an unrestricted Hartree-Fock approximation of a realistic five-orbital band and the standard on-site multi-orbital Coulomb interaction. We find that the competing non-collinear and non-uniform double-Q phases exist generally at the foot of the magnetic single-Q stripe dome in agreement with recent experiments, and separated from it by weak first order transitions. We contrast the electronic properties of the three different magnetic phases and study the consequences of the charge modulations formed around non-magnetic impurities. Finally we discuss the role of magnetic disorder relevant for the reported tetragonal magnetic phase in the Mn-122 compound.

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