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Resistivity Anisotropy and Novel Impurity-Induced States in Fe-based Superconductors BRIAN ANDERSEN, MARIA GASTIASORO, Niels Bohr Institute, University of Copenhagen, PETER HIRSCHFELD, Department of Physics, University of Florida — We investigate emergent impurity-induced states arising from point-like scatterers in the spin-density wave (SDW) phase of iron-based superconductors within a microscopic five-band model [1]. Independent of the details of the band-structure and disorder potential, it is shown how stable magnetic (pi,pi) unidirectional nematogens are formed locally by the impurities. Interestingly, these nematogens exhibit a dimer structure in the electronic density, are directed along the antiferromagnetic a-axis, and have typical lengths of 10 lattice constants in excellent agreement with recent scanning tunnelling experiments [2]. These electronic dimers provide a natural explanation of the dopant-induced transport anisotropy found e.g. in the 122 iron pnictides [3]. We also study the extension of the (pi,0) SDW state above the putative Neel transition temperature T_N by addition of magnetic impurities. This study is relevant for recent neutron scattering studies showing induced magnetic high-temperature phases for sufficient amounts of Mn substitution in 122 materials [4]. Below T_N neutron studies have found enhanced (pi,pi) scattering which also can be reproduced within our scenario [5].

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