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Conductivity Anisotropy in the Antiferromagnetic State of Iron Pnictides BELEN VALENZUELA, ELENA BASCONES, MARIA J. CALDERON, Inst. Ciencia de Materiales de Madrid-CSIC — Recent experiments on iron pnictides have uncovered a large in- plane resistivity anisotropy with a surprising result: the system conducts better in the antiferromagnetic x direction than in the ferromagnetic y direction [1]. We address this problem by calculating the ratio of the Drude weight along the x and y directions, D_x/D_y, for the mean-field $\mathbf{Q} = (\pi, \mathbf{0})$ magnetic phase diagram of a five-band model for the undoped pnictides [2,3]. We find [4] that D_x/D_y ranges between $0.2 < D_x/D_y < 1.7$ for different interaction parameters. Large values of the orbital ordering favor an anisotropy opposite to the one found experimentally. On the other hand, D_x/D_y is strongly dependent on the topology and morphology of the reconstructed Fermi surface. Our results point against orbital ordering as the origin of the observed conductivity anisotropy, which may be ascribed to the anisotropy of the Fermi velocity. [1] J.-H. Chu et al., Phys. Rev. B 81, 214502 (2010); J.-H. Chu et al., Science 329, 824 (2010); M. Tanatar et al., Phys. Rev. B 81, 184508 (2010). [2] M.J.Calderon, B. Valenzuela, E. Bascones, Phys. Rev. B 80, 094531 (2009). [3] E.Bascones, M.J. Calderon, B. Valenzuela, Phys. Rev. Lett. 104, 227201 (2010). [4] B.Valenzuela, E. Bascones, M.J. Calderon, Phys. Rev. Lett. 105, 207202 (2010).

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