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Nematic superconducting state in iron pnictides near optimal hole doping LIVIU CHIBOTARU, PAULO PEREIRA, KU Leuven, JUN LI, Nanjing University, VICTOR MOSHCHALKOV, KU Leuven — Nematic order often breaks the tetragonal symmetry of iron-based superconductors [1]. It arises from regular structural transition or electronic instability in the normal phase. Recently, a nematic superconducting state was observed which is not accompanied by a symmetry breaking of tetragonal lattice or the onset of magnetic order. Measurements of the angular dependence of the in-plane magnetoresistivity of single-crystalline thin samples of $Ba_{0.5}K_{0.5}Fe_2As_2$ in vicinity of T_c found large twofold oscillations with the rotation of the applied magnetic field in the basal plane [2]. Here we present the explanation of this unusual phenomenon on the basis of microscopic description of the superconducting state of these samples. We show that the nematic superconductivity arises from the weak mixture of the quasi-degenerate $s_{\pm}$ and $d_{x^2-y^2}$ components of the superconducting condensate, most probably induced by a weak anisotropy of stresses inherent to single-crystalline films.

[1] R. M. Fernandes, A.V. Chubukov and J. Schmalian, **Nat. Phys.** 10, 97 (2014)
[2] J. Li, et al., submitted to **P. N. A. S.** (2016)

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