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Impurity-Induced Electronic Nematic State in Iron-Pnictide Superconductors[1] YOUICHI YAMAKAWA, YOSHIO INOUE, HIROSHI KONTANI, Nagoya University — We propose that impurity-induced electronic nematic state is realized above the orthorhombic structure transition temperature T_S in iron-pnictide superconductors [1]. In the presence of strong orbital fluctuations near T_S, it is theoretically revealed that a single impurity induces non-local orbital order with C_2-symmetry, consistently with recent STM/STS measurements. Each impurity-induced C_2 orbital order aligns along a-axis by applying tiny uniaxial pressure along b-axis. In this impurity-induced nematic phase, the resistivity shows sizable in-plane anisotropy ($\rho_b/\rho_a \sim 2$) even above T_S, actually observed in various "detwinned" samples. The present study indicates the existence of strong orbital fluctuations in iron-pnictide superconductors. [1] Y. Inoue, Y. Yamakawa and H. Kontani, arXiv:1110.2401.

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