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What is the true parent state in alkali-doped Iron Selenides WEI LI, Fudan University, Shanghai, China, SHUAI DONG, Department of Physics, Southeast University, Njing, China, CHEN FANG, JIANGPING HU, Purdue University — By performing first-principles electronic structure calculations and analyzing effective magnetic model of alkali-doped iron selenides, we show that the materials without iron vacancies should approach a novel checkerboard phase in which each four Fe sites group together in tetragonal structure. The checkerboard phase is the ground state with a block antiferromagnetic (AFM) order and a small charge density wave order in the absence of superconductivity. Both of them can also coexist with superconductivity. The results explain mysterious 2 by 2 ordered patterns and hidden orders observed in various different experiments, clarify the missing link between AFM and superconducting phases, suggest that the block-AFM state is the parent state, and unify the understanding of various observed phases in alkali-doped iron selenides. (Reference: Wei Li, et al, arxiv:1110.0372 (2011))

Prefer Oral Session
 Prefer Poster Session

Wei Li
liweiphysics@gmail.com
Fudan University, Shanghai, China

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