**Pairing Mechanism of the FeSe- Systems: Dynamical Tuning of Pairing Cutoff Energy + Phonon Boost Effect**

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There are a group of FeSe systems: FeSe/SrTiO3 monolayer system (Tc~60-100K) and other heavily electron-doped iron selenide (**HEDIS**) compounds such as AxFe2-ySe2 (A=K, Rb, Cs, Tl, etc.) (Tc~30-40K), (Li1-xFexOH)FeSe (Tc~40K), etc. These systems have all very high Tc (30K -100K) despite having only the electron Fermi surfaces (FSs) but no hole FS.

Here I propose a unifying pairing mechanism [1,2] based on a new concept: dynamical tuning of pairing cutoff energy + all phonon boost effect. First, I show how the incipient band without a Fermi surface can participate pairing interaction through RG process and the system forms the **s++-**wave state only with the electron pockets. In this way, the **HEDIS** system can achieve the maximum ***Tc***, stored in the system, and yet avoid the detrimental impurity pair-breaking scattering. Second, I will show that the incipient band can turn all-momentum scattering local phonon into an effective forward-scattering phonon, hence enhance Tc of the incipient band superconductor.

Ref:

*[1] “Phonon Boost Effect on the S±-wave Superconductor with Incipient Band”*

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*[2] “Pairing mechanism of heavily electron doped FeSe systems”*

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