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Fine doping and temperature dependent ARPES study in deeply undersoped LSCO system YU HE, Department of Applied Physics, Stanford University; SIMES, RUIHUA HE, Department of Physics, Boston College, MAKOTO HASHIMOTO, SLAC, SUNG-KWAN MO, LBNL, SEIKI KOMIYA, Central Research Institute of Electric Power Industry, Japan, ZHI-XUN SHEN, Department of Applied Physics, Stanford University; SIMES — Deeply underdoped cuprates are known to be a host system for strong electron-phonon coupling physics. Set in the picture of lightly doped Mott insulator, extremely underdoped cuprates show prevailing evidence of polaron formation, as a natural result of strong bosonic interaction, which have gained support from both optical and transport measurements. Based on K. Shen and O. Roesch's pioneering work, we further studied fine doping and temperature dependence in the low-doping LSCO system, where antiferromagnetism and spin glass phases still persist. In this work, we will discuss the change in Fermi velocity in terms of doping, evolution of nodal gap as function of temperature and the possible contribution from lattice/spin degree of freedom in light of the small polaron's existence. Comparison with similar observations in manganites and iron-chalcogenides will be discussed to further address the ubiquity of the polaron physics in strongly correlated electron systems.

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