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Coexistence of superconducting and pseudogap quasiparticles in underdoped Bi2212: Studies of STM/STS and ultra-fast optical spectroscopy Y. H. LIU[1], T. KUROSAWA, Department of Physics, Hokkaido University, Sapporo 060-0810, Japan, Y. TODA, K. SHIMATAKE, Department of Applied Physics and Division of Innovative Research CRIS Hokkaido University, Sapporo 060-0810, Japan, N. MOMONO, Department of Materials Science and Engineering, Muroran Institute of Technology, Muroran 050-8585, Japan, M. ODA, M. IDO, Department of Physics, Hokkaido University, Sapporo 060-0810, Japan, NOKI MOMONO COLLABORATION, Y. TODA COLLABORATION — At present, the relationship between superconducting (SC) gap and psuedogap (PG) of cuprate superconductors is still under intense debate. Here, we present our recent results of the electronic structure and quasiparticle dynamics measured by STM/STS and ultra-fast optical spectroscopy on underdoped Bi2212 crystals, which provide direct evidence that SC and PG quasiparticles coexist below Tc. We will also discuss the origins of the periodic charge order and the nano-scale electronic inhomogeneity.

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