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Crystal Growth and Electronic Raman Scattering Study of Model High-Tc Cuprate HgBa2CaCu2O6+Ä LICHEN WANG, YUAN LI, XIANG-PENG LUO, JIARUI LI, School of Physics, Peking University, YUAN LI'S GROUP IN ICQM TEAM — In this talk, I will report our recent progress on crystal growth of HgBa2CaCu2O6+x (Hg1212), which possesses a simple tetragonal crystal structure and the highest ambient-pressure Tc (128 K) among all cuprate superconductors with two CuO2 sheets in the primitive cell. Improvement in single-crystal synthesis was made possible by using self-designed high-pressure furnaces and a two-layer encapsulation method, and we demonstrate that the hole concentration can be homogeneously tuned in the underdoped region by post-growth annealing. Our electronic Raman scattering experiments reveal that the maximum of the d-wave superconducting gap increases from single-layer HgBa2CuO4+x to double-layer Hg1212. In the same spectra, it is found that the characteristic energy of spin excitations, as manifested by the energy of the two-magnon signal, also increases in a nearly proportional fashion. This result is consistent with the idea that magnetic interactions are closely related to the Cooper pairing mechanism.

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