Growth and characterization of large HgBa$_2$CuO$_{4+\delta}$ single crystals

GUICHUAN YU, XUDONG ZHAO, LI LU, GUILLAUME CHABOT-COUTURE, MARTIN GREVEN, Stanford University — Using flux techniques, we have been able to grow unprecedentedly large HgBa$_2$CuO$_{4+\delta}$ (Hg1201) single crystal, exceeding 20 mm$^3$ in volume. Hg1201 is a model high-temperature superconductor, with the highest $T_c$ ($\sim 97$ K at optimal doping) among all single-layer cuprates and a simple tetragonal crystal structure. X-Ray and neutron scattering measurements demonstrate the single-grain nature of our crystals. We report results for the uniform susceptibility and the resistivity. Measurements of the $c$-axis resistivity and magnetoresistance were used to determine the pseudogap temperature at several hole densities.