

Abstract Submitted
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Synchrotron X-ray study reveals oxygen chains in $\text{HgBa}_2\text{CuO}_{4+\delta}$ ¹ WOJCIECH TABIS, University of Minnesota — X-ray scattering work shows that the double-layer high- T_c superconductors $\text{YBa}_2\text{Cu}_3\text{O}_{8+d}$ and $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{6+\delta}$ are intrinsically inhomogeneous [1-3], with short-range lattice modulations driven by oxygen dopants. $\text{HgBa}_2\text{CuO}_{4+\delta}$ (Hg1201) has a simpler (tetragonal) structure and the highest T_c (at optimal doping) among all single-layer cuprates. It is thus a very good candidate system to address the issue of charge modulations. Using synchrotron X-ray scattering and high-quality single crystals, we have observed a short-range lattice modulations in Hg1201. Careful analysis of the diffuse intensity pattern, and a study of the doping and temperature dependence, point toward the formation of local one-dimensional order in the form of uncorrelated oxygen chains in the charge-reservoir layer. The chains exist at intermediate and high doping, form along [100], and have typical lengths of 15-30 lattice constants [4].

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