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Distinct Charge Orders in the Planes and Chains of Ortho-III-Ordered YBa2Cu3O6 identified by Resonant elas- tic x-ray scattering D.G. HAWTHORN, A.J. ACHKAR, University of Waterloo, R. SUTARTO, University of British Columbia, X. MAO, University of Waterloo, F. HE, Canadian Light Source, A. FRANO, S. BLANCO-CANOSA, M. LE TACON, Max Planck Institute for Solid State Research, G. GHIRINGHELLI, L. BRAICOVICH, M. MINOLA, Politecnico di Milano, M. MORETTI SALA, European Synchrotron Radiation Facility, C. MAZZOLI, Politecnico di Milano, RUIXING LIANG, D.A. BONN, W.N. HARDY, University of British Columbia, B. KEIMER, Max Planck Institute for Solid State Research, G.A. SAWATZKY, University of British Columbia — Recently, charge density wave order with $Q = [0.3\ 0\ L]$ and $[0\ 0.3\ L]$ was detected for the first time in underdoped YBCO using resonant soft x-ray scattering at the Cu L_3 absorption edge. Here, we explore the energy and polarization dependence of the resonant scattering intensity in detwinned $YBa_2Cu_3O_{6.75}$ with ortho-III oxygen ordering in the chain layer. We show that the ortho-III order results in a commensurate peak at $H = 0.33$ whose energy and polarization dependence agrees with expectations for oxygen ordering in the chains. The $[0.3\ 0\ L]$ and $[0\ 0.3\ L]$ peaks, which result from a modulation of Cu $3d_{x^2-y^2}$ states in the CuO_2 planes, are shown to be distinct and seemingly unrelated to the structure of the chain layer. Moreover, the energy dependence of the $[0.3\ 0\ L]$ and $[0\ 0.3\ L]$ scattering intensity is found to result from a spatial modulation of the energies of the Cu $2p$ to $3d_{x^2-y^2}$ transition, similar to stripe-ordered 214 cuprates.

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