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Resonant Soft X-ray Scattering studies with Transition Edge Sensors YIZHI FANG, SANGJUN LEE, GILBERTO DE LA PENA, XIAOLAN SUN, Univ of Illinois - Urbana, FANNY RODOLAKIS, JESSICA MCCHESNEY, Argonne National Laboratory, JOE FOWLER, YOUNG IL JOE, WILLIAM DORIESE, KELSEY MORGAN, DANIEL SWETZ, JOEL ULLOM, National Institute of Standards and Technology, PETER ABBAMONTE, Univ of Illinois - Urbana — Resonant Soft X-ray has been one of the key techniques to study charge orders in high T_c cuperates. To solve the issue of unwanted enhancement of inelastic florescence background at resonance, we have developed an energy-resolving superconducting Transition-Edge Sensor microcalorimeters. These superconducting sensors obtain exquisite energy resolution by exploiting the superconducting-to-normal transition to photon energy and by operating at cryogenic temperatures ($\sim$ 70 mK) where thermal noise is minimal. This TES has demonstrated $\sim$ 1.0 eV resolution below 1 keV. We present first results using this detector to study the (002) Bragg peak and specular elastic scattering from a single crystal of stripe-ordered La2-xBa$_x CuO_4$ (x=0.125). Use of this detector for studying excitations and rejecting background fluorescence will be discussed.

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