

Abstract Submitted
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Ultrafast Carrier Dynamics of YBCO Films with Various In-plane Orientations Investigated by Pump-probe and Terahertz Spectroscopy SHYH-SHII PAI, ZEN-CHI LIN, PAO-AN LIN, CHENG-CHUNG CHI, INSTRUMENT TECHNOLOGY RESEARCH CENTER, NATIONAL APPLIED RESEARCH LABORATORIES, TAIWAN, ROC TEAM, INSTITUTE OF PHOTONICS TECHNOLOGIES, NATIONAL TSING HUA UNIVERSITY, TAIWAN, ROC TEAM, DEPARTMENT OF PHYSICS, NATIONAL TSING HUA UNIVERSITY, TAIWAN, ROC TEAM — In this study, we focus on the terahertz (THz) and optical responses of superconducting $\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$ (YBCO) films with various in-plane orientations. We report results and analyses of THz time domain spectroscopy and time-resolved photoinduced reflectivity experiments on four in-plane orientated superconducting YBCO films grown on yttria-stabilized zirconia substrates. Our study of the transmissions of THz time domain spectroscopy indicates a higher value of conductivity at room temperature for the 0° -orientation films than the 45° -films. Using the optical pump-THz probe scheme, we observed combinations of positive and negative THz transmission transients relative to a thermal equilibrium level with different relaxation times of about 0.9 and 9.0 ps respectively for all samples containing 45° -domains. Possible physical mechanisms will be discussed.

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