

Abstract Submitted
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**Temperature-dependence of
hypersound dynamics in SrTiO₃/SrRuO₃ heterostructures studied by ultrafast spectroscopy**

CHI-YUAN YANG, Institute of Physics, Academia Sinica, Taipei 11529, Taiwan; Department of Physics, National Taiwan University, Taipei 106, Taiwan, AJAY K YADAV, RAMAMOORTHY RAMESH, Department of Materials Science and Engineering, University of California, Berkeley, CA 94720, USA, YU-CHIEH WEN, CHIA-HAO HSU, MAW-KUEN WU, Institute of Physics, Academia Sinica, Taipei 11529, Taiwan, CHIH-TA CHIA, Department of Physics, National Taiwan Normal University, Taipei 106, Taiwan, KUNG-HSUAN LIN, Institute of Physics, Academia Sinica, Taipei 11529, Taiwan — Strontium titanate (SrTiO₃, STO) and strontium ruthenate (SrRuO₃, SRO) are complex oxide with perovskite structure. Their property, such as thermoelectricity and superconductivity, has been widely investigated for scientific and industrial purposes. Recently, complex oxide heterostructures can be grown by pulsed laser deposition. It opens many possibilities for new properties of materials. With ultrafast pump-probe spectroscopy, we demonstrated that metal-like SRO thin film can be served as a phonon transducer to generate hypersound with frequency of several tens to several hundreds of GHz. This technique can be utilized to study not only the elastic properties of perovskite thin films but also the interfaces. In this study, we used this technique to study the temperature dependence of structural phases in STO. During the crossing over the soft-mode transition in STO around 110 K, the shortening of phonon lifetime were also observed.

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