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THz rectified optical response of LaAlO₃/SrTiO₃ nanojunctions YANJUN MA, Department of Physics and Astronomy, University of Pittsburgh, Pittsburgh, PA 15260, USA, CHUNG WUNG BARK, SANGWOO RYU, CHANG-BEOM EOM, Department of Materials Science, University of Wisconsin, Madison, WI 53706, USA, JEREMY LEVY, Department of Physics and Astronomy, University of Pittsburgh, Pittsburgh, PA 15260, USA — Conducting AFM lithography can be used to create a variety of nanoscale devices at the LaAlO₃/SrTiO₃ interface¹². Nanoscale junctions have been shown to exhibit strongly localized photoconductivity over a range of wavelengths spanning the visible and near-infrared regime³. Powerdependent and interferometric measurements of these nanostructures with ultrafast laser pulses reveal a nonlinear photoconductive response attributed to second-order nonlinear susceptibility of SrTiO₃. The breaking of inversion symmetry comes from the strong local electric field that extends across the junction. The ultrafast response of these nanojunctions make them attractive candidates for generation and detection of THz radiation at molecular scales. This work is supported by NSF DMR-1104191.

¹C.Cen et al., Nature Material, 7, 298 (2008)

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²C.Cen et al., Science, **323**, 1026 (2009)

³P.Irvin et al., Nature Photonics, 4, 849 (2010)