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Photo-sensitive Transport Properties of the Two-dimensional Electron Gas at $LaAlO_3/SrTiO_3$ Interfaces T. HERNANDEZ, SANGWOO RYU, C.W. BARK, C.B. EOM, M.S. RZCHOWSKI, University of Wisconsin-Madison — Photoresistance has been previously well characterized in highly resistive ($> 10^6$ $\Omega/\square$) $LaAlO_3/SrTiO_3$ heterostructures, showing a decrease in resistance on exposure to light. In some cases insulating heterostructures with $LaAlO_3$ layer below the critical thickness have become conducting on exposure to light. Here we report on the effects of light exposure on much lower sheet resistance ($\sim 10^4$ $\Omega/\square$) $LaAlO_3/SrTiO_3$ interfaces, which we find to show a non-negligible increase in resistance. This effect is opposite to the behavior of our more resistive samples. We discuss temperature and magnetic field dependence, possible mechanisms for this behavior, and the implications for other transport properties.

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