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**Analysis of bell-shape negative giant-magnetoresistance in high mobility GaAs/AlGaAs 2D electron systems using multi-conduction model.** RASANGA SAMARAWEERA, HAN-CHUN LIU, Georgia State University, WERNER WEGSCHEIDER, ETH Zurich, RAMESH MANI, Georgia State University — Recent advancements in the growth techniques of the GaAs/AlGaAs two dimensional electron system (2DES) routinely yield high quality heterostructures with enhanced physical and electrical properties, including devices with 2D electron mobilities well above  $10^7$  cm<sup>2</sup>/Vs. These improvements have opened new pathways to study interesting physical phenomena associated with the 2D electron system. Negative giant-magnetoresistance (GMR) is one such phenomenon which can be observed in the high mobility 2DES. However, the negative GMR in the GaAs/AlGaAs 2DES is still not fully understood. In this contribution, we present an experimental study of the bell-shape negative GMR in high mobility GaAs/AlGaAs devices and quantitatively analyze the results utilizing the multi-conduction model [1]. The multi-conduction model includes interesting physical characteristics such as negative diagonal conductivity, non-vanishing off-diagonal conductivity, etc. The aim of the study is to examine GMR over a wider experimental parameter space and determine whether the multi-conduction model serves to describe the experimental results. [1] R. G. Mani, A. Kriisa, and W. Wegscheider, *Sci. Rep.* 3, 2747 (2013).

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