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Spin-polarized 2DEG through electrostatic field doping in LaAlO₃-EuO heterostructures JAEKWANG LEE, NA SAI, ALEXANDER A. DEMKOV, The Department of Physics, University of Texas at Asutin — We recently presented theoretical calculations in support of the **electrostatic doping model** for the *n*-type LaAlO₃/SrTiO₃ interface and offered a consistent picture explaining the origin of charge and its localization at the interface: the strong internal electric field of the polar oxide (LAO) causes charge transfer to the conduction band of the adjacent oxide STO. In this talk we extend this concept to explore theoretically the possibility of creating a **spin polarized 2DEG** at the heterointerface between LAO and ferromagnetic semiconducting EuO. We use the density functional theory within the generalized gradient approximation (GGA) as implemented in the VASP code. We reports that the amount of spin polarized charge transferred from LaAlO₃ to EuO is of the order of $4.0 \times 10^{13} \text{ cm}^{-2}$ and then exponentially decays to 5-6 EuO ($\sim 10 \text{ \AA}$) with 2 DEG characteristic.

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