Can an oxygen vacancy form a Kondo center at the LaAlO$_3$/SrTiO$_3$ interface?\textsuperscript{1} MOHAMMAD SHERAFATI, BIRABAR NANDA, SASHI SATPATHY, University of Missouri — Recently a Kondo resistance minimum has been observed at the interface between LaAlO$_3$ and SrTiO$_3$\textsuperscript{[1]}. It has been suggested that the effect is due to the scattering of interface electrons from magnetic centers just like in the original Kondo effect; however, the origin of such magnetic centers is not understood. In this work, we evaluate the idea of whether an oxygen vacancy in SrTiO$_3$ might produce a magnetic center. We focus on an isolated vacancy in bulk SrTiO$_3$ from density-functional calculations and provide evidence that of the two electrons released to the system by the oxygen vacancy, one becomes localized near the vacancy site, while the other forms a delocalized state. The results suggest that the localized electron could form a Kondo center resulting in a resistance minimum as observed in the experiments.


\textsuperscript{1}Work supported by the US Department of Energy