

Abstract Submitted
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Can an oxygen vacancy lead to the Kondo resistance minimum observed at the $\text{LaAlO}_3/\text{SrTiO}_3$ interface?¹ SASHI SATPATHY, BIRABAR NANDA, University of Missouri-Columbia — Recently a Kondo resistance minimum has been observed at the interface between LaAlO_3 and SrTiO_3 [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. If there are sufficient vacancies, the delocalized electrons could form the conduction electrons, scattering off of the localized vacancy states behaving as Kondo scatterers. The detail results for this scenario will be discussed.

[1] A. Brinkman *et al.*, Nature Mater. **6** 493 (2007).

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