

Abstract Submitted  
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**External tuning of the spin state of oxygen vacancies at strontium titanate surfaces**<sup>1</sup> OLEG BROVKO, ICTP, Trieste (Italy), ERIO TOSATTI, SISSA / ICTP, Trieste (Italy) — Among the wealth of optical, electronic and magnetic phenomena induced in strontium titanate ( $\text{SrTiO}_3$ ) bulk or at its surface by vacancies or dopants, oxygen-vacancy-induced magnetism remains one of the most studied yet still one of the least understood ones. Here we use density functional theory to explore the possibility of dynamically switching the multiplet state of an oxygen vacancy or a vacancy cluster at ideal and reconstructed  $\text{SrTiO}_3$  surfaces by external stimuli such as charge injection, electric bias or tip-induced force fields. We relate the mechanism responsible for the change in the spin state to charge redistribution at the vacancy site. Since each state change should imply, as for a quantum dot, a dissipation channel for the external agent, these ideas can be tested experimentally, e.g. within the scope of atomic force microscopy at low temperatures.

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Oleg Brovko  
ICTP, Trieste

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