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| Title: | Electronic structure modification of the KTaO ₃ single-crystal surface by Ar ⁺ bombardment |
| Authors: | Halder, Soumyadip (/jspui/browse?type=author&value=Halder%2C+Soumyadip) Sharma, Minaxi (/jspui/browse?type=author&value=Sharma%2C+Minaxi) Singh, Inderjit (/jspui/browse?type=author&value=Singh%2C+Inderjit) Venkatesan, A. (/jspui/browse?type=author&value=Venkatesan%2C+A.) |
| Keywords: | Oxygen perovskite oxid KTaO ₃ Ar ⁺ irradiation |
| Issue Date: | 2017 |
| Publisher: | APS |
| Citation: | Physical Review B, 96 (11) |
| Abstract: | Oxygen vacancies play an important role in controlling the physical properties of a perovskite oxide. We report alterations in the electronic properties of a cubic perovskite oxide, namely, KTaO ₃ , as a function of oxygen vacancies. The conducting surface of the KTaO ₃ single-crystal substrate has been realized via Ar ⁺ irradiation. The band gap changes as a function of conductivity which is controlled by irradiation time, indicating the formation of defect states. Kelvin probe force microscopy suggests a sharp increase in the work function upon Ar ⁺ irradiation for a short period of time followed by a monotonic decrease, as we increase the irradiation time. Our experimental findings along with theoretical simulations suggest a significant surface dipole contribution and an unusual change in the electronic band line-up of KTaO ₃ due to oxygen vacancies. |
| Description: | Only IISERM authors are available in the record. |
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