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東京大学微細構造解析プラットフォーム
公開講演会

“Mechanically tuned conductivity: dislocations and potential barriers”

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Mechanical or one-dimensional doping: The defect chemistry is modified if dislocations are introduced. In ceramics, these have both an enhanced local volume, a core charge and a compensating cylindrical charge. Most examples will stem from the model oxide ceramic system $SrTiO_3$. I specifically describe work on single crystals [1].

Potential barriers: I describe the approach of inserting the chemistry of a polycrystalline varistor ceramic into a bicrystal interface with well-defined polarization conditions. The chemistry at the bicrystal interface defines the distribution of interfacial defect states and is responsible for the formation of the electrostatic potential barrier. I will show how stress can tune the potential barrier in head-to-head and tail-to-tail orientation of the polarization vector to enhance/lower the conductivity across ZnO bicrystal interfaces. Our prior work was focused on polycrystalline ZnO [2].

References

[1] E.A. Patterson, et al., „Temperature dependent deformation and dislocation density in SrTiO3 single crystals”, J. Amer. Ceram. Soc., 99 [10] 3411-120 (2016)

[2] Baraki, R. et al. Varistor piezotronics: Mechanically tuned conductivity in varistors. J. Appl. Phys. 118, 085703 (2015)

Sep 27 (Wed), 2017 14:00～15:30
Main meeting room at Institute of Engineering Innovation, UT
(工学部総合研究機構　9 号館 1 階　大会議室)
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