

Abstract Submitted
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Undergraduate Research Experience: Electrical conductivity of novel amorphous Fe-Tb-Dy-O thin films.¹ ALEXANDRA WATERS, TATIANA ALLEN, University of Tennessee, Chattanooga, HUMAIRA TAZ, RAMKI KALYANARAMAN, University of Tennessee, Knoxville — We studied electrical properties of novel amorphous ternary oxides of chemical composition (Me)₂O₃, where primary metal (Me) was iron, along with two lanthanides, terbium and dysprosium. The material was recently reported [1] to show a combination of very high optical transparency, electrical conductivity, and Hall mobility. The mobility values observed in this material are comparable to the best indium-based transparent conductive oxides, and considerably higher than mobility in amorphous silicon. The material may be very promising for electronic applications. We studied resistivity (by van-der-Pauw method) and the Hall mobility of the films deposited by electron beam co-evaporation. We also studied the evolution of electrical conductivity of the material with repeated thermal cycling between 290 and 700K. [1] Malasi A. *et al.* Novel Iron-based ternary amorphous oxide semiconductor with very high transparency, electronic conductivity, and mobility. *Sci. Rep.* **5**, 18157; doi:10.1038/srep18157(2015).

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Alexandra Waters
University of Tennessee, Chattanooga

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