Abstract Submitted
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EPR studies and consequences of oxygen annealing on the electrical properties of Mg-doped In_2O_3 thin films[1] SUMAN BHANDARI, M. E. ZVANUT, Univ of Alabama - Birmingham — Indium oxide (In_2O_3) is a transparent conducting oxide that can be thought of as a potential candidate for applications in transparent electronics. Defects in In_2O_3 thin films are studied using electron paramagnetic resonance (EPR) and their contributions to electrical properties are investigated by Hall measurements. An In_2O_3:Mg thin film, deposited on r-Al_2O_3 by plasma assisted molecular beam epitaxy, was annealed for 30 min in O_2 from 200 C to 900 C and analyzed by EPR at 300 K. The EPR results show a monotonic decrease in defect concentration with increase in annealing temperature. The isotropic g-value of the defect is 2.0054. An increase in resistivity and decrease in electron concentration were reported by others after O_2 annealing of similar samples. The results are consistent with our EPR data and suggest that the defect detected by EPR is an oxygen vacancy. To further understand the material, the effect of O_2 annealing on In_2O_3, doped with different Mg concentrations, will be presented at the conference. The preliminary results show an increase in resistivity and decrease in defect concentration as Mg increases. The data suggest a model that the donors, assumed to be the EPR detected defects, are compensated by the Mg acceptor.

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