

Abstract Submitted  
for the MAR17 Meeting of  
The American Physical Society

**Structural evolution of ultrathin film iron oxide and BiFeO<sub>3</sub> in ozone assisted MBE deposition** HAWOONG HONG, Argonne National Lab, XINYUE FANG, TAL-C. CHIANG, University of Illinois, Urbana-Champaign — Iron oxide films were grown on sapphire (0001) surfaces using nominally 100% ozone. Both of monolayer-wise deposition and continuous deposition were tried to find the structures of the films at the start of the film formation. The studies utilized x-ray scattering with synchrotron radiation from the Advanced Photon Source. Consideration of substrate and film structures predicts Fe<sub>2</sub>O<sub>3</sub>(0001) (hematite) film formation. However, in both of the deposition modes, the initial films formed as magnetite Fe<sub>3</sub>O<sub>4</sub>(111). As the film growth progresses, hematite (Fe<sub>2</sub>O<sub>3</sub>(0001)) appears. At the later stage, the magnetite disappears and the whole film turned to hematite. The same techniques were employed for the investigation of BiFeO<sub>3</sub> growth. At the early stages, the layer spacing showed interesting variation through the film. The influence of the interfaces will be discussed

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Date submitted: 28 Nov 2016

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