

Abstract Submitted  
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**Properties of layered iron oxychalcogenides with checkerboard structure**<sup>1</sup> LIANG L. ZHAO, DANIEL WARD, DOUGLAS NATELSON, EMILIA MOROSAN, Department of Physics and Astronomy, Rice University, Houston TX 77005 — The layered iron oxychalcogenides  $\text{La}_2\text{O}_3\text{Fe}_2\text{X}_2$  ( $\text{X} = \text{S}, \text{Se}$ ) have a unique checkerboard-like  $\text{Fe}_2\text{OX}_2$  sublattice. Their Mott insulating behavior makes them promising candidates for novel superconductors. In this talk, we present results on the isostructural  $\text{A}_2\text{F}_2\text{Fe}_2\text{OS}_2$  ( $\text{A} = \text{Sr}, \text{Ba}$ ) compounds. Both pure and doped samples are characterized by magnetization, resistivity, heat capacity and Raman spectroscopy measurements. In addition to the previously reported antiferromagnetic transition around  $T_N \approx 100$  K, we observed another phase transition in the ordered state, as well as a possible structural phase transition near room temperature. A change in the excitation gap at the high temperature (structural) phase transition is indicated by the temperature dependent resistivity.

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Liang Zhao  
Department of Physics and Astronomy, Rice University, Houston TX 77005

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