

Abstract Submitted  
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**Resonant Ultrasound studies of double perovskites  $A_2FeReO_6$  ( $A=Ba, Ca$ )**<sup>1</sup> LING LI, Dept. Materials Science and Engineering, The University of Tennessee, JIAQIANG YAN, DAVID MANDRUS, Dept. Materials Science and Engineering, The University of Tennessee and Materials Science and Technology Division, Oak Ridge National Laboratory, VEERLE KEPPENS, Dept. Materials Science and Engineering, The University of Tennessee — The elastic response as a function of temperature (50-380) K and magnetic field (0-2) T has been studied using Resonant Ultrasound Spectroscopy (RUS) for the polycrystalline double perovskites  $A_2FeReO_6$  ( $A= Ba, Ca$ ). An elastic softening over a wide temperature range is observed below the Curie temperature ( $T_c \sim 305K$ ) of  $Ba_2FeReO_6$ , which is suppressed upon the application of a magnetic field. For  $Ca_2FeReO_6$ , both the longitudinal and shear modulus show a step-like softening starting around 140K, indicative of a structural transition. A large change in the magnetoelastic coupling constant is observed at this temperature, suggesting that this transition is strongly coupled to the magnetic properties of this material.

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