Abstract Submitted
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Resonant Ultrasound studies of spin- and orbital ordering transitions in RVO_3[1] M. KOEHLER, Dept. Materials Science and Engineering, The University of Tennessee, J.-Q. YAN, Dept. Materials Science and Engineering, The University of Tennessee and Materials Science and Technology Division, Oak Ridge National Laboratory, Y. REN, X-ray Science Division, Argonne National Laboratory, B.C. SALES, Materials Science and Technology Division, Oak Ridge National Laboratory, D. MANDRUS, Dept. Materials Science and Engineering, The University of Tennessee and Materials Science and Technology Division, Oak Ridge National Laboratory, V. KEPPENS, Dept. Materials Science and Engineering, The University of Tennessee — RVO_3 perovskites (R = rare earth) have been shown to undergo multiple spin and orbital transitions due to the Jahn-Teller active V^{3+} electrons. We have initiated a study of the elastic response of RVO_3, (R = Dy, Gd, Ce) as well as $Y_{1-x}La_xVO_3$ (x = 0.05, 0.3, 1) using resonant ultrasound spectroscopy. The temperature-dependence of the elastic response is dominated by the ordering transitions, with transition temperatures that change with the size of the rare earth. For $CeVO_3$ and $LaVO_3$, two transitions are observed, separated by 17K and 2K, respectively. $DyVO_3$ and $Y_{0.95}La_{0.05}VO_3$ show three transitions below 220K while $GdVO_3$ only shows one. The full elastic tensor of $Y_0.7La_{0.3}VO_3$ has also been determined from 300K to 50K, yielding the temperature dependence of the 9 orthorhombic elastic moduli.

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Veerle Keppens
Dept. Materials Science and Engineering, The University of Tennessee

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