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Neutron Diffraction Study of A-site Size and Variance Effect on the Spin and Orbital Ordering in RVO_3 Perovskites J.-Q. YAN, S. CHANG, J. ZARESTKY, O. GARLEA, R. MCQUEENEY, Ames Laboratory, Neutron and X-ray Group, Ames, IA50011, A. LIOBET, Los Alamos National Lab, Y. REN, Argonne National Lab, J. FIERAMOSCA, Argonne National Lab — RVO_3 members all exhibit an intriguing sequence of orbital and magnetic orderings below a T_{OO} and a T_N , respectively. Since only t-electrons are active in this system, they have been a prototype to study cooperative orbital ordering among the π -bonding t orbitals in the absence of σ -bonding e electrons and the relationship of this orbital order to long-range magnetic ordering. We have studied the A-site size and variance effect on the spin and orbital ordering in single phase (YLa)VO₃ and (YLaLu)VO₃ systems by magnetization, specific heat, thermal conductivity, and neutron diffraction measurements. The results show that both A-site size and variance stabilize G-type magnetically, C-type orbitally ordered state before an electronic phase segregation takes place. The results will be presented with special emphasis on the neutron diffraction experiments for both single crystal and polycrystalline samples.

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