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Magnetic Properties of A-site Antiferromagnetic Spinels $CoRh_2O_4$ and $CuRh_2O_4$ LUWEI GE, School of Physics, Georgia Tech, JOSHUA FLYNN, Department of Chemistry, Oregon State University, JOSEPH PADDISON, School of Physics, Georgia Tech, MATTHEW STONE, STUART CALDER, Quantum Condensed Matter Division, Oak Ridge National Laboratory, ARTHUR RAMIREZ, Department of Physics, UC Santa Cruz, MAS SUBRAMANIAN, Department of Chemistry, Oregon State University, MARTIN MOURIGAL, School of Physics, Georgia Tech — We characterize the magnetic properties of the A-site spinels $CoRh_2O_4$ and $CuRh_2O_4$ by means of thermodynamic and neutron scattering measurments and perform group theory analysis, Rietveld refinement, mean-field theory, and spin wave theory calculations to analyze our results. Our investigation reveals that $CoRh_2O_4$ is a canonical $S = 3/2$ diamond-lattice Heisenberg antiferromagnet with a nearest neighbor exchange $J = 0.63$ meV and a Néel temperature of 25 K. In $CuRh_2O_4$, the distorted diamond lattice leads to the development of an incommensurate helical order at 24 K. Strong reduction of the ordered moment is observed for the $S = 1/2$ spins and reproduced by $1/S$ corrections to spin-wave theory.

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