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Metamagnetism and Nonlinear Susceptibilities in the Bilayer Ruthenate $Sr_3Ru_2O_7$[1] D PHELAN, Argonne National Labs, B. SHIVARAM, Univ of Virginia, A VECCHIONE, ROSALBA FITTIPALDI, CNR-SPIN and Dipartimento di Fisica, Salerno, Italy — We report measurements of the third and fifth order nonlinear susceptibilities in the correlated oxide metamagnet, $Sr_3Ru_2O_7$ for both orientations of the magnetic field, H parallel to the c-axis and in the basal plane. In both geometries we observe peaks in the temperature dependence of the higher order susceptibilities. The position in temperature where the peak in the fifth order susceptibility occurs is at half the temperature where a peak in the third order susceptibility is seen. The latter in turn is at half the temperature where the peak in the linear susceptibility is known to occur. This simple scaling is common to both orientations of the magnetic field. These results will be discussed in the context of similar work with heavy fermion metamagnets[1].

[1]"Universality in the Magnetic Response of Metamagnetic Metals", B.S. Shivaram, D.G. Hinks, and Pradeep Kumar, Phys. Rev. B89, 241107(R), 2014.

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