Abstract Submitted
for the 4CS19 Meeting of
The American Physical Society

NuSTAR Observations of ABELL 2163: Constraining Non-Thermal Emission RANDALL ROJAS, DANIEL WIK, QIAN WANG, University of Utah — Since the first non-thermal detections of inverse Compton (IC) emission in galaxy clusters at hard X-ray energies, we have yet to unambiguously confirm IC in follow-up observations. Claims of large IC fluxes from the 10' extent of Abell 2163, a massive merging cluster at z = 0.2, make it the next best chance of confirming a previous IC detection with NuSTAR. To confirm IC detections we implement three separate models: a one temperature model, a multi-temperature model, and a single temperature + power law model (which models IC scattering) and use statistical methods to determine the best model for the temperature distribution of the intracluster medium. We find that the global NuSTAR spectrum is consistent with pure thermal emission, with a global temperature of $kT = (11.77 \pm 0.13)$ keV. Our model provides a constraint on IC emission of 1.62×10^{-12}ergs^{-1}cm^{-2} as well as a value for the magnetic field of the cluster, B > 0.22 μG or B > 0.35 μG using the normalization obtained from a nine temperature model, which fall between previous measurements made in other studies.

Randall Rojas
University of Utah

Date submitted: 13 Sep 2019 Electronic form version 1.4