Abstract Submitted
for the MAS21 Meeting of
The American Physical Society

Supermassive Black Holes and the Low Redshift Lyman-α Forest MEGAN TILLMAN, BLAKESLEY BURKHART, Rutgers University, STEPHANIE TONNESEN, SIMEON BIRD, GREG BRYAN, SULTAN HASSAN, RACHEL SOMERVILLE, Flatiron Institute — The Lyman-α forest has been utilized by astronomers for decades to constrain our conceptual understanding of cosmology and the physics of the intergalactic medium. Despite this fact, our theoretical understanding breaks down at low redshift where the observed Lyman-α forest remains in conflict with cosmological hydrodynamic simulations. As seen in Kollmeier et al. 2014, there appear to be missing photons in simulations implying a lack of understanding of the heating mechanisms required for proper levels of photoionization. Additional studies exploring this conflict propose that an updated ultraviolet background and proper implementation of active galactic nuclei (AGN) feedback are enough to resolve the conflict at low redshift. We analyze the effects of AGN feedback models on the low redshift forest. We produce the column density distribution function and Doppler parameter distribution for variations on two different feedback models using the CAMELS simulations. We find that varying the strength of the feedback model and the specific sub-grid model used for feedback can have dramatic effects on the low redshift Lyman-α forest.

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Date submitted: 15 Nov 2021 Electronic form version 1.4