Bulletin of the AAS • Vol. 54, Issue 6

Watch Out For the Fuzz: Missing Gas in IllustrisTNG Halos

Jacob Morgan[1] Jeremy Bailin[2]

[1]University of Alabama, [2]University of Alabama, Tuscaloosa

Published on: Jun 29, 2022

URL: https://baas.aas.org/pub/2022n6i207p03

IllustrisTNG is a widely used suite of hydrodynamical simulations, but we found that most users are likely missing up to 5% of the gas mass within the virial radius of halos generated by TNG. An FoF (“friend of friends”) algorithm determines what gas in the simulation is assigned to each halo. Approximately one third of gas cells are not in any halo: this gas is called “fuzz”. However, at certain densities, temperatures, and halo-centric distances this decision becomes (perhaps necessarily) arbitrary for individual gas cells. We use a method of loading gas data that avoids this issue, and instead loads all gas in a given volume of the simulation. Preliminary findings suggest the FoF algorithm functions as a permeable, stochastic density threshold which preferentially misses low density gas. At the same time, the fuzz does not match gas of similar densities in the same region. In this poster, we compare fuzz gas and halo gas at similar radii and densities to explore the implications of this omission.