

Abstract Submitted  
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**A new approach to subhalo mass modeling in cosmology simulations** IMRAN SULTAN, NICK FRONTIERE, KATRIN HEITMANN, SALMAN HABIB, EVE KOVACS, PATRICIA LARSEN, ADRIAN POPE, STEVE RANGEL, TOM URAM, Argonne Natl Lab — The Last Journey simulation, an extreme-scale gravity-only cosmology simulation, ran on the Mira supercomputer at the Argonne Leadership Computing Facility and evolved over 1.24 trillion particles in a  $(5025 \text{ Mpc})^3$  volume. We plan to add galaxies to Last Journey using a semi-analytic model; the result of this project will enable us to create detailed synthetic sky maps for cosmological surveys. To include subhalo information in galaxy modeling, we have developed a core tracking approach which is much less computationally expensive than subhalo finding. We accumulate and track cores, the central particles of halos, for all output steps. Using a downscaled simulation, we have applied a subhalo mass loss model found in literature to cores of halos that have merged into a host. We show that the mass function of the modeled cores agrees well with the mass function of subhalos identified by a subhalo finding algorithm after adjusting the model parameters, providing a powerful tool to use within semi-analytic galaxy modeling.

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