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Building Synthetic Skies for Future Sky Surveys

Wednesday, 1 August 2018 16:00 (20 minutes)

Upcoming sky surveys require large-volume, high-quality simulated extra-galactic catalogs for such diverse tasks as investigating various data-analysis strategies, understanding and mitigating systematic errors, developing and testing analysis pipelines, and studying observing strategies. In order to prepare adequately for the rich and complex datasets to be delivered by these surveys, the astrophysics-cosmology community needs simulated catalogs that provide a wide range of detailed galaxy properties whose distributions match those of the observational data. We describe the end-to-end simulation pipeline, starting from gravity-only N-body simulations. We present a new hybrid method of populating dark-matter halos with galaxies that combines empirical methods with semi-analytic galaxy modeling. We also discuss DESCQA, a new software framework that was developed by the LSST-DESC collaboration, and is capable of testing and validating a variety of catalogs against a diverse set of physics requirements.

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