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Cosmology from the Rubin Void Size Function

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Cosmic voids are a powerful tool to extract cosmological constraints and study galaxy properties' dependence on the environment. The project develops a pipeline to constrain cosmological parameters using the Void Size Function (VSF) derived from LSST-like galaxy mock catalogs, employing the VIDE void finder. The analysis incorporates a theoretical model accounting for tracer bias, redshift-space distortions, and the Alcock-Paczynski effect. For the first time, theoretical predictions for the void size function is compared to measurements from photometric redshift data, enabling an assessment of statistical and systematic photometric uncertainties. The resulting constraints targeted are key cosmological quantities such as the dark energy equation of state, matter clustering amplitude (σ_8), dark matter density, total neutrino mass, and overall cosmic content.

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