Contribution ID: **264**   Type: **Talk in a parallel session**

Constraining Cosmological Parameters Combining 2- and 3-Point Correlation Functions: First Step Towards the Future Euclid Dataset

Tuesday, 9 July 2024 17:00 (18 minutes)

For galaxy clustering, constraining cosmological parameters using the three-point correlation function, despite being pivotal, has historically been limited by the computational cost of modelling. Here, we introduce a new emulator developed within the framework of a Euclid Preparation Key-Project activity, which substantially accelerates MCMC evaluation. For the first time in a simulation study, we present then constraints on cosmological parameters by combining two- and three-point statistics. As a result, we will also present an overview of the future perspectives and ongoing activities on cosmological parameters inference analyses from lower- and higher-order correlation functions in configuration space focusing on the BAO scale regime as a potential powerful tool to disentangle and investigate cosmological models.

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Session Classification: The Euclid mission: current status, results from early observations, and future prospects

Track Classification: Dark Energy and Large Scale Structure (DE): The Euclid mission: current status, results from early observations, and future prospects