Contribution ID: **92** Type: **Oral contribution**

Fast emulation of two-point angular statistics for photometric galaxy surveys

Wednesday, September 28, 2022 12:00 PM (20 minutes)

We develop a set of machine-learning based cosmological emulators, to obtain fast model predictions for the C(ℓ) angular power spectrum coefficients characterising tomographic observations of galaxy clustering and weak gravitational lensing from multi-band photometric surveys (and their cross-correlation). A set of neural networks are trained to map cosmological parameters into the coefficients, achieving a speed-up $O(10^3)$ in computing the required statistics for a given set of cosmological parameters, with respect to standard Boltzmann solvers, with an accuracy better than 0.175% (<0.1% for the weak lensing case). This corresponds to ~2% or less of the statistical error bars expected from a typical Stage IV photometric surveys. Such overall improvement in speed and accuracy is obtained through (i) a specific pre-processing optimisation, ahead of the training phase, and (ii) a more effective neural network architecture, compared to previous implementations.

Author: LUCA, Biggio (ETH Zurich)

Presenter: LUCA, Biggio (ETH Zurich)

Session Classification: Session 5