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Simulation-Based Inference (SBI) for cosmology with type Ia Supernovae (SNe Ia).

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Systematic uncertainties associated to calibration, selection function and astrophysical effects are dominating the error budget of SN Ia cosmology. Correction methods applied to account for these systematics, and especially for the complex combination of selection function and astrophysical variability, are questionable, particularly given the current H0 and Lambda tensions for which SN Ia data are central.

Recently, the ZTF survey has produced a volume-limited sample of more than a thousand of SNe Ia, allowing us to directly probe the distribution of SNe Ia parameters without being affected by selection effects. We use the skysurvey simulator to simulate the ZTF volume limited dataset in order to train a neural network that infers input simulation parameters.

This novel inference method, called SBI, is a promising avenue to solve the complex problem of cosmological inference with SNe Ia data, and thus to accurately derive H0, w0 and wa. I will review in this talk the status of this ongoing activity.

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