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TSPT: Time-Sliced Perturbation Theory for Large Scale Structure

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I will present a new perturbative approach to the description of cosmological structures in the mildly non-linear regime relevant at the distance scales from 10 to 100 Mpc. In this framework equal-time correlation functions of cosmological perturbations are calculated using an ensemble with time-dependent statistical weight. The scheme is free from unphysical infrared divergencies plaguing the traditional approaches and allows a systematic resummation of large infrared contributions to all orders of the perturbation theory. This greatly improves the description of the density power spectrum in the region of baryon acoustic oscillations. I will mention future directions, which include infrared resummation of higher-point correlation functions and renormalisation of the contributions coming from short-wavelength modes.

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