Sixteenth Marcel Grossmann Meeting



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Let us bury the prehistoric h: arguments against using Mpc/h units in observational cosmology

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It is common to express cosmological measurements in units of Mpc/h. Here, I review some of the complications that originate from this practice. A crucial problem caused by these units is related to the normalization of the matter power spectrum, which is commonly characterized in terms of the linear-theory rms mass fluctuation in spheres of radius 8 Mpc/h, σ 8. This parameter does not correctly capture the impact of h on the amplitude of density fluctuations. I show how the use of σ 8 has caused critical misconceptions for both the socalled σ 8 tension regarding the consistency between low-redshift probes and cosmic microwave background data and the way in which growth-rate estimates inferred from redshift-space distortions are commonly expressed. We propose to abandon the use of Mpc/h units in cosmology and to characterize the amplitude of the matter power spectrum in terms of σ 12, defined as the mass fluctuation in spheres of radius 12 Mpc, whose value is similar to the standard σ 8 for h ~ 0.67.

Primary author: SANCHEZ, Ariel G. (Max Planck Institute for Extraterrestrial Physics)

Presenter: SANCHEZ, Ariel G. (Max Planck Institute for Extraterrestrial Physics)

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