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Title: Sunyaev-Zeldovich effect as tool to probe fundamental physics

Abstract

Data of the Cosmic Microwave Background (CMB) temperature anisotropies measured by the Planck satellite can be used, together with a sample of galaxy clusters, to probe the standard cosmological model and the underlying theory of gravity. To avoid antenna beam effects, we brought all HFI Planck maps to the same resolution, and used a CMB template to subtract the cosmological signal while preserving the Thermal Sunyaev-Zeldovich (TSZ) anisotropies. Then, we removed galactic foreground emissions around each cluster and we masked out all known point sources. Once the cleaning procedure is completed, for each galaxy cluster in our sample, we measured the TSZ effect within a fixed aperture. These data have been used to constrain the deviation from the adiabatic evolution of the Universe, the spatial variation of the fine structure constant, and decaying dark energy.

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