Abstract for an Invited Paper
for the TSS16 Meeting of
the American Physical Society

Constraints on Macroscopic Gravity from Planck[1]

THARAKE WIJENAYAKE, WEIKANG LIN, MUSTAPHA ISHAK, University of Texas at Dallas

We use the exact and covariant averaging framework of macroscopic gravity (MG) to study the relativistic corrections to cosmology due to non-linear phenomena occurring at small scales. We present constraints on MG using the cosmic microwave background (CMB) temperature anisotropy data from Planck, and other cosmological probes. For the MG model, the effects of small-scale structure on the homogeneous and isotropic background and the evolution of large-scale structure can be encapsulated by just one parameter ($\Omega_{\mathcal{A}}$). We find that $\Omega_{\mathcal{A}}$ is close to consistent with zero and can be constrained to $-0.03 \leq \Omega_{\mathcal{A}} \leq 0$ (at the 95% CL). The strong correlation between $\Omega_{\mathcal{A}}$ and Ω_{Λ}, σ_8 and H_0, leads to significant increase in the error bars associated with those values.