

Effect of the Tidal Charge Parameter on CMBR Temperature Anisotropies

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Abstract : We present the temperature anisotropy of the cosmic microwave background radiation due to the inhomogeneity region constructed on a 3-brane in the framework of a Randall-Sundrum one brane immersed into a 5D bulk AdS_5 spacetime. We employ the Brane-World Friedmann-Lemaitre-Robertson-Walker (FLRW) cosmological model to describe the cosmic expansion on the brane. The inhomogeneity is modeled by the static, spherically symmetric spacetime that replaces the spherically symmetric part of a dust-filled universe and is connected to the FLRW spacetime through the junction conditions. As the vacuum region expands it induces an additional frequency shift to a CMBR photon passing through this inhomogeneity in comparison to the case of a photon propagating through a pure FLRW spacetime. This frequency shift is associated with the effective temperature change of the CMBR in the corresponding direction. We give an estimate of the CMBR effective temperature changes with the change of the value of the tidal charge parameter.

Keywords : CMBR, Randall-Sundrum model, Rees-Sciama effect, Braneworld

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