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Alleviating tensions in the CMB using Planck scale physics: A Cosmic Tango between the very large and very small

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The PLANCK satellite has observed certain anomalies in the Cosmic Microwave Background (CMB) that bring out a tension between the standard six-parameter Λ CDM cosmological model and observations. The possibility that these anomalies could be tell-tale signatures of fundamental physics at the Planck scale is exciting. We show that this possibility is realized within Loop Quantum Cosmology (LQC) where the primordial power spectrum is modified due to Planck scale physics. In particular, we will show that the primordial power spectrum generated in LQC alleviates the power anomaly at large angular scales and tension in the lensing amplitude. This talk is based on research carried out in collaboration with Abhay Ashtekar, Brajesh Gupt and Donghui Jeong and reported in PRL 125, 051302 (2020) and Front. Astron. Space Sci. 8:685288 (2021).

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