7.1 COMPARISON WITH OBSERVATIONAL DATA

The modified field equations and Friedmann equations derived from our 7dU model make specific predictions about the expansion history of the universe and the behavior of gravity. We can compare these predictions with existing observational data to assess the viability of our model.

- <u>Accelerated Expansion</u>: The modified Friedmann equations can be used to fit the observed accelerated expansion of the universe without the need for dark energy. [4] (see Appendix 12 for detailed curvature replacement model and comparison with Λ CDM). By adjusting the coupling constant (κ) and the stress-energy tensor for the extra dimensions T_{mn} , we can reproduce the expansion history inferred from supernovae measurements and other cosmological observations.
- <u>Cosmic Microwave Background Radiation</u>: The cosmic microwave background (CMB) radiation provides a snapshot of the early universe. Our model predicts specific features in the CMB power spectrum that could be tested against observations from experiments like Planck. [9]
- <u>Large-Scale Structure</u>: The distribution of galaxies and matter on large scales is influenced by the underlying cosmology. Our model predicts a specific pattern of galaxy clustering and matter distribution that can be compared with observations from galaxy surveys. [4]