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The cosmological observations for a novel and efficient model of dark energy

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It is a fact that the universe lives on a gravitational wave background (GWB), which is extra space–time energy that is not contained in Einstein's field equations. In a previous work, this energy is treated as a property of space–time and not as a source. With this in mind, a new model was developed that incorporates this energy to explain the current accelerated expansion of the universe where the GWB was incorporated by extending Einstein's equations to $R-1/2Rg + (2\pi^2/\lambda^2)g = {}^2T$, where λ is the Compton wavelength of the cosmological scale graviton. In the present talk, we show that this extended form agrees very well with the observations of cosmic chronometers, baryon acoustic oscillations, and Pantheon SN Type Ia, reproducing the observational data with a $\Delta\chi^2 = 3.26$ in favour of the current model compared to the ΛCDM. The favoured values by these observations are $\Omega_m = 0.311\pm0.065$, $H_0 = 68.3\pm1.4 km\, s^{-1} Mpc^{-1}$, and $\Omega_k = 0.001\pm0.011$. We also find that this model fits excellently with the observed cosmic microwave background and mass power spectrum data, if $H_0 = 68 km\, s^{-1} Mpc^{-1}$. We conclude that this model is an excellent alternative to explain the accelerated expansion of the universe without incorporating the cosmological constant or some type of extra matter.

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