Abstract Submitted
for the APR20 Meeting of
The American Physical Society

Resolving the CMB Anisotropies using the variable physical constants approach. RAJENDRA GUPTA, Univ of Ottawa — The resolution of the Cosmic Microwave Background anisotropies by the ΛCDM model is considered the key reason why this model is so universally adopted by most cosmologists. We have shown that the CMB anisotropies can also be explained using variable physical constants approach without requiring the cosmological constant Λ. With this approach, the position of the first peak in the observed angular power spectrum of CMB has the multipole moment value of *229* using the redshift z =*1090*, i.e. the same as observed and as determined by the ΛCDM models. The same approach recently was used to resolve the flatness problem and to show that the universe is negatively curved[1]. The approach also resolved three astrometric anomalies and fitted the most up-to-date supernovae Ia data better than the ΛCDM model[2]. Now, by correctly estimating the multipole moment of the fundamental mode in the CMB anisotropy, the new approach has reached another milestone to establish that the speed of light varies as $c = c_0/(1+z)^{1.8}$ and the gravitational constant varies as $G = G_0/(1+z)^{5.4}$. Other physical constants are also evolutionary[2]. The universe is negatively curved with curvature $R_c = R_{c,0}/(1+z)^{3.3}$ where $R_{c,0} = 1.64 c_0/H_0$and H_0 is the Hubble constant[1]. [1] R. P. Gupta, *Galaxies* **7**, 77 (2019); [2] Ibid 55.

Rajendra Gupta
Univ of Ottawa

Date submitted: 11 Jan 2020 Electronic form version 1.4