

Abstract Submitted
for the APR20 Meeting of
The American Physical Society

New data on the space curvature may support a non- inflationary geometrical solution for the horizon problem¹ BRANISLAV VLAHOVIC, MAXIM EINGORN, North Carolina Central University, COSMIN ILIE, Colgate University — Encouraged by the recent Planck data, which suggests that the Universe is curved and closed, we are presenting new results on our alternative interpretation of the CMB uniformity [1]. Within the Λ CDM model supplemented in the spherical space with an additional perfect fluid with the constant parameter $1/3$ in the linear equation of state, there is an elegant solution of the horizon problem without inflation. Under the proper parameter choice, light travels between the antipodal points during the age of the Universe. Thus, one can suggest that the observed CMB radiation originates from a very limited spatial region. Consequently, the CMB uniformity can be explained without the inflationary scenario. In addition, this removes any constraints on the uniformity of the Universe at the early stage and opens a possibility that the Universe was not uniform and that the creation of galaxies and large structures may be caused by the inhomogeneities that originated in the Big Bang. We reach the agreement with the supernovae data at the same level of accuracy as within the Λ CDM model and show that changing the amplitude of the initial power spectrum one can adjust the proposed cosmological model to the CMB anisotropy and that the discussed change is inside the experimentally allowed constrains. [1] B. Vlahovic, M. Eingorn, C. Ilie, Modern Physics Letters A, 30, 1530026 (2015).

¹NSF CREST award - 1345219

Branislav Vlahovic
North Carolina Central Univ

Date submitted: 15 Jan 2020

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