Inflation as a spontaneous symmetry breaking of Weyl symmetry

Alexander Barnaveli [a,b], *Tomislav Prokopec* [b], *Stefano Lucat* [b]

e-mail: s.barnaveli@gmail.com

[a] Department of Physics, Faculty of Exact and Natural Sciences, Javakhishvili Tbilisi State University, 3, Chavchavadze Ave. , Tbilisi 0179, Georgia

[b] Institute for Theoretical Physics, Spinoza Institute and EMMEΦ, Utrecht University, Postbus 80.195, 3508 TD Utrecht, The Netherlands

In the current work [1] we will be concerned with getting inflationary solutions from a conformally invariant gravity. To achieve conformality we introduce torsion into the theory. We argue the form of a general conformally invariant scalar action for a general curved spacetime which is our starting point. We study it's properties and write it in a convenient form - this gives us interesting insights about the special features coming from the introduction of torsion. Using this action we derive the inflationary solutions. In due process we also show, that inflation is realized through radiative symmetry breaking and the mass scales of the theory are generated dynamically. After studying the properties of the inflationary solutions, we compare them to the current experimental data and examine the ranges of the free parameters of our theory for which we are getting a viable model of inflation. We discover, that this model gives us the values of the parameters that are close to Starobinsky inflation. In the end we also discuss the interesting features of our model coming from the conformal symmetry, interpret the results and make final the conclusions.

References

[1] **Barnaveli, Alexander**, Stefano Lucat, and Tomislav Prokopec. "Inflation as a spontaneous symmetry breaking of Weyl symmetry." *Journal of Cosmology and Astroparticle Physics* ,. **01** (2019): 022.