

Cosmological constant due to quantum corrections to the effective potential

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In this work, we show that quantum corrections to some cosmological models [1] can lead to a significant modification of the behaviour of the initial potential and the appearance of a non-zero ground state energy of the Universe which can be interpreted as a cosmological constant. We apply the formalism of the effective potential to the simplest forms of α -attractors which can be represented by the so-called T -models and E -models [2]. We derived the generalised renormalisation group (RG) equations that sum up the whole sequence of leading logarithmic contributions to the effective potential. As a result, the accounting of quantum corrections leads to a change of character and a lift of the effective potential [3, 4]. We interpreted this uplift as the appearance of the cosmological constant Λ for the T^2 and E^2 models. Thus, we have found out that the cosmological constant Λ may exist as a consequence of quantum corrections to the effective potential with some value of the scale transmutation parameter μ even in non-renormalizable models of inflation. And the value of the cosmological constant Λ allows one to fix the parameter μ which is a free parameter in the non-renormalizable theory.

- [1] Kazakov D I, Iakhibbaev R M and Tolkachev D M 2023 *JCAP* **09** 049 (*Preprint* 2308.03872)
- [2] Kallosh R, Linde A and Roest D 2013 *JHEP* **11** 198 (*Preprint* 1311.0472)
- [3] Kazakov D I, Iakhibbaev R M, Tolkachev D M and Filippov V A 2024 *PoS* **022**
- [4] Kazakov D I, Iakhibbaev R M, Tolkachev D M and Filippov V A 2024 *Natural Science Review* (*Preprint* 2405.18818) URL <https://arxiv.org/abs/2405.18818>