

On stable exponential cosmological solutions with two factor spaces in the Einstein-Gauss-Bonnet model with a Λ -term

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We study D -dimensional Einstein-Gauss-Bonnet gravitational model including the Gauss-Bonnet term and the cosmological term Λ . We find a class of solutions with exponential time dependence of two scale factors, governed by two Hubble-like parameters $H > 0$ and h , corresponding to factor spaces of dimensions $m > 2$ and $l > 2$, respectively. These solutions contain a fine-tuned $\Lambda = \Lambda(x, m, l, \alpha)$, which depends upon the ratio $h/H = x$, dimensions of factor spaces m and l , and the ratio $\alpha = \alpha_2/\alpha_1$ of two constants (α_2 and α_1) of the model. The master equation $\Lambda(x, m, l, \alpha) = \Lambda$ is equivalent to a polynomial equation of either fourth or third order and may be solved in radicals. The explicit solution for $m = l$ is presented in Appendix. Imposing certain restrictions on x , we prove the stability of the solutions in a class of cosmological solutions with diagonal metrics. We also consider a subclass of solutions with small enough variation of the effective gravitational constant G and show the stability of all solutions from this subclass.

Primary author(s) : Dr. IVASHCHUK, Vladimir; Mr. KOBTSEV, Aleksandr (Institute for Nuclear Research of the Russian Academy of Sciences)

Presenter(s) : Mr. KOBTSEV, Aleksandr (Institute for Nuclear Research of the Russian Academy of Sciences)

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