

On stability of exponential cosmological solutions with non-static volume factor in the Einstein-Gauss-Bonnet model

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A $(n+1)$ -dimensional gravitational model with Gauss-Bonnet term and cosmological constant term is considered. When ansatz with diagonal cosmological metrics is adopted, the solutions with exponential dependence of scale factors: $a_i \sim \exp(v^i t)$, $i = 1, \dots, n$, are considered. We study the stability of the solutions with non-static volume factor, i.e. if $K(v) = \sum_{k=1}^n v^k \neq 0$. We prove that under certain restriction R imposed solutions with $K(v) > 0$ are stable while solutions with $K(v) < 0$ are unstable. Certain examples of stable solutions are presented. We show that the solutions with $v^1 = v^2 = v^3 = H > 0$ and zero variation of the effective gravitational constant are stable if the restriction R is obeyed.

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