

Regular and Chaotic Regimes in Scalar Field Cosmology

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A transient chaos in a closed isotropic cosmological model with a scalar field is studied. We describe different regimes and show that the type of dynamics in this model depends on the scalar field potential. For power-law potentials we have a transient chaos with a rather simple fractal structure of trajectories. This chaotic structure disappears for exponentially steep potentials. On the other hand, for shallow potentials islands of regular dynamics appear in the chaotic "sea". This another type of regular dynamics has a quasiperiodical nature and was not described previously in the standard cosmology. We have found also that for potentials with large cosmological constant the chaotic behavior disappears in a way different from the steep potential case.