

Documents

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Szekeres universes with homogeneous scalar fields

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Abstract

We consider the existence of an “inflaton” described by an homogeneous scalar field in the Szekeres cosmological metric. The gravitational field equations are reduced to two families of solutions which describe the homogeneous Kantowski–Sachs spacetime and an inhomogeneous FLRW(-like) spacetime with spatial curvature a constant. The main differences with the original Szekeres spacetimes containing only pressure-free matter are discussed. We investigate the stability of the two families of solution by studying the critical points of the field equations. We find that there exist stable solutions which describe accelerating spatially-flat FLRW geometries. © 2018, The Author(s).

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