

Dynamical System Study of Steep Exponential Potential

A large number of cosmological observations suggest that the present universe is undergoing an accelerated expansion. The driving force responsible for this expansion is called dark energy (DE). A number of cosmological models have been proposed to account for this unknown DE component and a scalar field quintessence model is one of the main candidates for Dark Energy. The quintessence scalar field models are usually characterized by the associated potential and a large variety of potentials have been explored in this context.

Recently scalar field models with very steep potentials have been considered as candidate for DE [1]. In this paper we have analysed the dynamics of such steeper potential models using the centre manifold theory [2]. We have solved the system of autonomous differential equations for steep exponential potential models and have shown that in most of the cases a steep exponential model does not provide a very stable solution.

References:

1. M. Shahalam et al., arXiv:1802.00326 [gr-qc]
2. S. Bahamonde et al., arXiv:1712.03107 [gr-qc]

Primary author: Dr SUDIPTA DAS¹, MANISHA BANERJEE¹, NANDAN ROY (1 Department of Physics, Visva-Bharati, Santiniketan-731235, West Bengal 2 Departamento de Fisica, DCI, Campus Leon, Universidad de Guanajuato, 37150, Leon, Guanajuato, Mexico)

Presenter: Dr SUDIPTA DAS¹, MANISHA BANERJEE¹, NANDAN ROY (1 Department of Physics, Visva-Bharati, Santiniketan-731235, West Bengal 2 Departamento de Fisica, DCI, Campus Leon, Universidad de Guanajuato, 37150, Leon, Guanajuato, Mexico)