

Fracral Reconstruction of Dilaton Field

Mustafa SALTİ, Oktay AYDOĞDU

Department of Physics, Faculty of Arts and Science, Mersin University,
Mersin-33343, Turkey

msalti@mersin.edu.tr, oktaydogdu@mersin.edu.tr

Abstract

Numerous papers have been presented[1,2,3,4,5] to implement the dynamics of scalar field describing nature of the dark energy by establishing a connection between the pilgrim/new agegraphic/Ricci/ghost/holographic energy density and a scalar field definition. These works showed that the analytical form of potential in terms of the scalar field cannot be obtained due to the complexity of the involved equations. On the other hand, writing a meaningful quantum gravity theory is one of the tough puzzles in modern theoretical physics[6,7]. In the quantum gravity theories, the universe is described as a dimensional flow and one can discuss whether and how these attractive features are connected with the ultraviolet-divergence problem[8]. That's why, such important points motivated us to reconstruct the potential and dynamics of the dilaton scalar field model[9] according to the evolutionary behavior of the extended holographic energy description[10] in fractal geometry.

Referances

- [1] Sahni, V., *Dark Matter and Dark Energy*, Lect. Notes Phys. Vol.653, 141-180, 2004.
- [2] Chiba, T., Okabe, T. and Yamaguchi, M., *Kinetic Driven Quintessence*, Phys. Rev. D, Vol.62, No.2, 023511-02351, 2000.
- [3] Feng, B., Wang, X.L. and Zhang, X.M., *Dark energy constraints from the cosmic age and supernova*, Phys. Lett. B, Vol.607, Nos.1-2, 35-41, 2005.
- [4] Caldwell, R.R., *A phantom menace? Cosmological consequences of a dark energy component with super-negative equation of state*, Phys. Lett. B, Vol.545, Nos.1-2, 23-29, 2002.
- [5] Copeland, E.J., Sami, M. and Tsujikawa, S., *Dynamics of dark energy*, Int. J. Mod. Phys. D, Vol.15, No.11, 1753-1935, 2006.
- [6] Calcagni, G., *Fractal Universe and Quantum Gravity*, Phys. Rev. Lett. Vol.104, No.25, 251301, 2010.
- [7] Calcagni, G., *Quantum field theory, gravity and cosmology in a fractal universe*, JHEP, Vol.2010(3), No.120, 1-38, 2010.
- [8] Salti, M. and Aydogdu, A., *Holographic Tachyon in Fractal Geometry*, Math. Comput. Appl. Vol. 21, No.21, 1-12, 2016.

[9] Piazza, F. and Tsujikawa, S., *Dilatonic ghost condensate as dark energy*, JCAP, Vol.2004(7), No.004, 1-28, 2004.

[10] Miao, L., Xiao-Dong, L., Shuang, W. and Yi, W., *Dark Energy*, Communications in Theoretical Physics, Vol.56, No.3, 525-604, 2011.

The Cauchy Problem for Complex Intuitionistic Fuzzy Differential Equations

A. EL ALLAoui, S. MELLIANI

LMACS, Laboratoire de Mathématiques Appliquées & Calcul Scientifique
Sultan Moulay Slimane University, PO Box 523, 23000 Beni Mellal
Morocco
said.melliani@gmail.com

Abstract

In this paper, we discuss the existence of a solution to the Cauchy problem for complex intuitionistic fuzzy differential equations. We first propose definitions of complex intuitionistic fuzzy sets and discuss entailed results which parallel those of complex fuzzy sets.

Keywords : complex intuitionistic fuzzy sets, complex intuitionistic fuzzy differential equations.

References

- [1] K. Atanassov, (1986), *Intuitionistic fuzzy sets*, Fuzzy Sets and Systems, 20, 87-96.
- [2] K. Atanassov, (1999), *Intuitionistic Fuzzy Sets : Theory and Applications*, Springer Physica-Verlag, Heidelberg.
- [3] K. Atanassov, T., Vassilev, P. M., and Tsvetkov, R. T. (2013), *Intuitionistic Fuzzy Sets*, Mea-sures and integrals Bulgarian Academic Monographs (12), Professor Marin Drinov Academic Publishing House, Sofia.
- [4] R. Ettoussi, S. Melliani, M. Elomari and L. S. Chadli, *Solution of intuitionistic fuzzy differential equations by successive approximations method*, 19th Int. Workshop on IFSs, Burgas, 4-6 June 2015 Notes on Intuitionistic Fuzzy Sets ISSN 1310-4926 Vol. 21, 2015, No. 2, 51-62.
- [5] M. Elomari, S. Melliani, R. Ettoussi and L. S. Chadli, *Intuitionistic fuzzy semigroup*, 19th Int. Workshop on IFSs, Burgas, 4-6 June 2015 Notes on Intuitionistic Fuzzy Sets ISSN 1310-4926 Vol. 21, 2015, No. 2, 43-50.