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Exactly solvable quantum models on nonarchimedean spaces

Goran S. Djordjević*and Ljubiša Nešić†
Department of Physics, University of Nis, Serbia and Montenegro

Abstract

The exactly solvable models are of a great significance in any theory in physics. In this review we consider a class of exactly solvable quantum (minisuperspace cosmological) models over archimedean and nonarchimedean spaces. First of all we consider (4+D)-dimensional Kaluza-Klein cosmological model with two scaling factors. One of them corresponds to the D-dimensional internal space, and second one to the 4-dimensional universe. We present basic ideas and results concerning this model in standard cosmology and construct corresponding p-adic quantum model and explore existence of its p-adic ground state. The special attention is paid to the $4+1$ dimensional model. The corresponding propagators on real and p-adic spaces are calculated. The forms of these propagators are discussed. In brief we discuss some results for an exactly solvable model in string cosmology.

Keywords: exactly solvable models, nonarchimedean spaces, Kaluza-Klein quantum cosmology, p-adic numbers.

*gorandj@junis.ni.ac.yu
†nesiclj@junis.ni.ac.yu