

# DYNAMICS OF TACHYON FIELDS ON (NON-)ARCHIMEDEAN SPACES - TOWARDS ORIGIN OF INFLATION.

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We review the formulation and some elaboration of quantum cosmology, i.e. cosmology on the non-Archimedean space and its relation to cosmology on the Archimedean one.

$p$ -Adic quantum cosmology [1] is an application of  $p$ -adic quantum theory to the universe as a whole. Geometry of  $p$ -adic spaces has a non-Archimedean structure. Under some restrictions product of the ordinary wave function and its  $p$ -adic counterparts gives adelic wave function [2]. In adelic Feynman's path integral approach integration over non-Archimedean geometries is also taken into account [3].

The adelic generalization of the Hartle-Hawking proposal does not work in models with matter fields.  $p$ -Adic and adelic minisuperspace quantum cosmology is well defined as an ordinary application of  $p$ -adic and adelic quantum mechanics. It is illustrated by a few of cosmological models. As a result, these models exhibit some discreteness of the minisuperspace.

The main focus is on consideration of a class of tachyon-like potentials, inspired by string theory,  $D$ -brane dynamics [4] and cosmology in the context of classical and quantum mechanics. Motivated by the trans-Planckian problem in the very early stage of cosmological evolution of the Universe [5], we consider the theoretical role of DBI-type tachyon scalar field [6]. To simplify the equation of motion for the scalar field, canonical transformations are defined and engaged [7]. The corresponding quantum propagators in the Feynman path integral approach are calculated and discussed, as there are possibilities for a quantum adelic generalization and its application in the beginning, i.e. origin of inflation [8].

## References

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