

PATH INTEGRALS ON REAL, p -ADIC, AND ADELIC SPACES

Zoran Rakić (*Faculty of Mathematics, Belgrade, Serbia*),
zrakic@matf.bg.ac.rs

We study path integrals in ordinary, p -adic and adelic quantum mechanics for systems determined by quadratic Lagrangians.

The corresponding probability amplitudes $\mathcal{K}(x'', t''; x', t')$ for two-dimensional systems with quadratic Lagrangians are found. The obtained expressions are generalized to any finite-dimensional spaces. These exact general formulas are presented in the form which is invariant under interchange of the number fields $\mathbb{R} \longleftrightarrow \mathbb{Q}_p$ and $\mathbb{Q}_p \longleftrightarrow \mathbb{Q}_{p'}, p \neq p'$. This invariance shows the fundamental rôle of adelic path integral in mathematical physics of quantum phenomena.

This is joint work with Branko Dragović.

The work was partially supported by the project ON174012 of MPNTR of Republic of Serbia.