

Adelic Feynman amplitudes in lower orders of perturbation theory

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Abstract

We formulate convergency conditions for adelic Feynman amplitudes and prove that for spaces of sufficiently high dimension, there exists a nonempty domain in the space of powers of propagators in which the adelic amplitude is correctly defined. We investigate an analytic continuation w.r.t. the power of propagators in amplitudes of the ϕ^4 theory in the third and fourth order of the perturbation theory. We demonstrate that these amplitudes cannot be continued to the whole complex plane (assuming the validity of the Riemann hypothesis about zeros of the zeta-function) and physically meaningful values of the propagator powers lie at the boundary of the analyticity domain.
