

Singularities of adelic Feynman amplitudes

Lerner E., Missarov M.

Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

We study adelic ϕ^4 -theory with propagator, given by homogeneous adelic function. It is shown that almost all ultraviolet and infrared poles of Euclidean Feynman amplitude are cancelled by zeroes of the infinite product of p-adic Feynman amplitudes. Analytic continuation in the degree of homogeneity of general adelic Feynman amplitude is constructed. We prove that all adelic ϕ^4 -theory amplitudes can be continued to the half-plane. There are an infinite number of amplitudes whose natural domain of analyticity is given by this half-plane provided the Riemann conjecture about ζ -function zeroes is valid.

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Keywords

Analytic continuation, Feynman amplitudes, p-adic and adelic models, Riemann ζ -function