Particle Theory Seminar

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PSI

"Path Integrals for Stochastic Scattering"

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Abstract:

The numerical evaluation of real-time path integrals which occur in time-dependent processes (like scattering) has remained a big challenge. At present only zero-energy scattering seems to be amenable to Euclidean Monte-Carlo methods. Here I describe an attempt which is based on a recent path-integral representation of the T-matrix for non-relativistic scattering in a local potential. In this approach the functional integration is over velocities and the eikonal approximation is obtained when all velocity fluctuations are suppressed. This can be achieved by giving the particle a complex mass so that a Monte-Carlo evaluation of the velocity path integral can be performed for different values of the imaginary part (width). The method of "partial averaging" is used to accelerate the convergence and the results are then extrapolated to zero width. I will present some preliminary results which show the feasibility of this approach.