

Real-time evolution of quantum tunneling via the thimble approach

Thursday, 8 December 2022 15:40 (20 minutes)

Quantum tunneling has been playing an important role in various fields of theoretical physics. So far, the only way for us to gain insights into the mechanism is to use the instanton method, which is based on imaginary-time formalism. However, to study its dynamics, it is essential to use real-time formalism, whose path integral is highly oscillatory. Fortunately, Picard-Lefschetz theory can be used to make the integral converge, enabling us to perform the Monte Carlo simulation. In this work, we apply the Monte Carlo simulation based on thimbles to study the real-time evolution of the tunneling process. In particular, we show that quantum tunneling can be characterized by the dominance of complex classical solutions in the $\hbar \rightarrow 0$ limit.

Primary author: Dr YOSPRAKOB, Atis (Niigata University)

Presenter: Dr YOSPRAKOB, Atis (Niigata University)

Session Classification: Parallel session A