

## The Feynman-Kac formula in the Fourier representation and its applications

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The famous Feynman-Kac (FK) formula for the operator  $H = -\Delta + V$  is related to an integral over trajectories of a Brownian motion generated by  $-\Delta$ . This formula is extremely efficient in a variety of situations, from Financial Mathematics to Quantum Mechanics. However, it does not work (at least in the usual way) when the Laplacian  $\Delta$  is replaced with a function  $\kappa(\Delta)$  (say,  $\sqrt{-\Delta}$  or  $\Delta^2$ ). In this case, it is possible to propose another integral formula, emerging in the Fourier representation, related to an integral over trajectories of a jump Markov process generated by the potential term  $V$ . In this talk I will explain the Fourier-FK-formula and give examples of its application.