

## Path Integrals and Born-Jordan Quantization

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The Feynman formulation of quantum mechanics apparently takes a classical model (described by a Lagrangian or Hamiltonian) and constructs a propagator via the method of path integrals. This would then seem to imply a mathematical route from classical to quantum, and therefore a quantization rule. We shall describe the limit of the classical action between two endpoints where the spatial separation is fixed but the time of travel is short. This serves as an approximation for the time slices approximating the phase space path integral. We show that the natural approximation leads to an average of the Shubin  $\tau$ -quantization, for  $\tau$  uniformly distributed in  $[0, 1]$ , and that this corresponds to the Born-Jordan quantization rule. We connect this with the paper of Smolyanov, Tokarev and Truman on phase space path integrals via the Chernoff formula.

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