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Wigner distribution functions for complex dynamical systems: a path integral approach DRIES SELS, WIM MAGNUS, FONS BROSENS, University of Antwerp — Starting from Feynman's Lagrangian description of quantum mechanics, we propose a method to construct explicitly the propagator for the Wigner distribution function of a single system. For general quadratic Lagrangians, only the classical phase space trajectory is found to contribute to the propagator. Inspired by Feynman's and Vernon's influence functional theory we extend the method to calculate the propagator for the reduced Wigner function of a system of interest coupled to an external system. Explicit expressions are obtained when the external system consists of a set of independent harmonic oscillators.

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