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Semi-classical approximations based on de Broglie-Bohm theory

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Semi-classical approximations to quantum theory describe part of the system classically and part quantum mechanically. In the usual approach, one considers the classical system to move under a mean force, obtained by averaging over the quantum system. We consider an alternative approach based on de Broglie-Bohm theory. This approach has shown to yield better results than the mean force approach for certain non-relativistic systems by e.g. Prezhdo and Brooksby, and Gindensperger et al. We present such semi-classical approximations for quantum electrodynamics and quantum gravity.

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