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Derivation of the master equation for a particle in an external field which is subject to continuous measurement.

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<p>The theory of continuous measurement provides a tool to monitor the evolution of the wave function of a single quantum system in real time. We derive the master equation in the non-selective regime for the dynamics of the wave function of a particle in an external potential which is subject to continuous measurement of position. In the derivation we view continuous measurement as the limit of a sequence of unsharp position measurements. Unsharp position measurements are described by generalised measurement observables, or in mathematical terms, positive operator valued measures (POVM) rather than the standard von Neumann projection operators which are a special class of the sub-class of POVM's called projection valued measures (PVM). We discuss a method which introduces a commutative algebra for non-commuting operators in order to carry out the summation of the corresponding measurement operators. In addition we reveal the stochastic Ito equations for the selective regime of measurement.

Level (Hons, MSc,
   PhD, other)?

Msc

Consider for a student
   award (Yes / No)?

Yes

Would you like to <br> submit a short paper <br> for the Conference
 Proceedings (Yes / No)?

Yes

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