What is quantum about quantum trajectory equations? JAY
GAMBETTA, Institute of Quantum Computing, HOWARD WISEMAN, STEVE
JONES, ERIC CAVALCANTI, Griffith University — Quantum trajectory equations
are stochastic equations for the state of an open quantum system conditioned on a
monitoring i.e. a continuous-in-time measurement of a bath to which it is coupled.
They are closely related to classical stochastic equations for classical probability
distributions called filtering equations (e.g. the Kalman filter). Given this close
relation, the question arises: what is quantum about quantum trajectory equations?
In this talk I suggest that the answer lies in the ability of an experimenter to choose
different monitoring schemes. Moreover, I propose that there is an experimental
way to distinguish between cases where this choice does demonstrate the quantum
nature of the noise, and those where it does not.

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