1077-93-619   **Francesco Ticozzi*** (`ticozzi@dei.unipd.it`), Dept. of Information Engineering, University od Padova, via gradenigo 6/B, 30174 Padova, PD, Italy. *Stabilization of stochastic quantum dynamics via open and closed loop control.*

We investigate parametrization-free solutions of the problem of quantum pure state preparation stabilization by means of Hamiltonian control, continuous measurement and quantum feedback, in the presence of a Markovian environment. In particular, we show that whenever suitable dissipative effects are induced by either the unmonitored environment or non Hermitian measurements, there is no need for feedback control to accomplish the task. Constructive necessary and sufficient conditions on the form of the open-loop controller can be provided in this case, by resorting to a deterministic system via the support theorem and building on existing results for quantum dynamical semigroups. When open-loop control is not sufficient, one can employ filtering-based feedback control laws to steer the evolution towards the target pure state. We show that the approach presented by Mirrahimi and van Handel, SIAM Cont. Opt., 2007, can be used to fill the gap, and thus applied to a quite general class of quantum dynamics undergoing continuous observations. (Received September 08, 2011)