Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

A universal scheme for indirect quantum control[1] DAVID LAYDEN, University of Waterloo (Department of Applied Mathematics), Institute for Quantum Computing, EDUARDO MARTIN-MARTINEZ, ACHIM KEMPF, University of Waterloo (Department of Applied Mathematics), Institute for Quantum Computing, Perimeter Institute for Theoretical Physics — The goal of indirect quantum control is to coherently steer a quantum system solely by acting on a quantum actuator to which it is coupled. This approach to quantum control is convenient in many physical settings, as it allows one to avoid direct addressing of the system—and any associated difficulties—altogether. While it is known in principle that control of the actuator typically yields universal control of the system, the practical details of how such indirect control can be achieved are less clear. This deficiency has led to a number of implementation- and model-specific indirect control schemes, in lieu of a general recipe applicable to any physical setting. Here, we present such a recipe, in the form of an open-loop control scheme which implements arbitrary unitary operations on the system by exploiting open dynamics in the actuator.

[1]arXiv:1506.06749

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Date submitted: 05 Nov 2015 Electronic form version 1.4