## Abstract Submitted for the DAMOP07 Meeting of The American Physical Society

Steering, Entanglement, Nonlocality, and the EPR Paradox<sup>1</sup> HOWARD WISEMAN, STEVE JONES, Centre for Quantum Dynamics, Griffith University, DOHERTY ANDREW, University of Queensland — The concept of steering was introduced by Schroedinger in 1935 as a generalization of the EPR paradox for arbitrary pure bipartite entangled states and arbitrary measurements by one party. Until now, it has never been rigorously defined, so it has not been known (for example) what mixed states are steerable (that is, can be used to exhibit steering). We provide an operational definition, from which we prove (by considering Werner states and Isotropic states) that steerable states are a strict subset of the entangled states, and a strict superset of the states that can exhibit Bell-nonlocality. For arbitrary bipartite Gaussian states we derive a linear matrix inequality that decides the question of steerability via Gaussian measurements, and we relate this to the original EPR paradox.

<sup>1</sup>Supported by the Centre for Quantum Computer Technology of the Australian Research Council

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Date submitted: 28 Feb 2007 Electronic form version 1.4