Abstract Submitted
for the DAMOP10 Meeting of
The American Physical Society

Non-monotonicity in the quantum-classical transition for the harmonic oscillator ANDREW C. MCCLUNG, TYLER E. KEATING, ADAM T.C. STEEGE, ARJENDU K. PATTANAYAK, Carleton College — The negative volume of a Wigner function can be considered a measure the degree of quantumness of a system. In the absence of decoherence, this measure of quantumness of an harmonic oscillator increases with the energy eigenstates n. This seeming disagreement with the correspondence principle is of course resolved when considering decoherence. Interestingly, when any decoherence is introduced, an eigenstate n_{peak} with 'maximal quantumness' results so that the quantum-classical transition is non-monotonic. The value of n_{peak} decreases with time and strength of environmental coupling.

Andrew C. McClung
Carleton College

Date submitted: 20 Jan 2010 Electronic form version 1.4