Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Semiclassical position and momentum entropies for families of single-particle potentials MARK COFFEY, Colorado School of Mines — Information and entropy concepts are playing an ever larger role in foundational physics and quantum computing. We have recently obtained the semiclassical position and momentum entropies for a variety of model systems that show the effect of different interactions upon information content. Besides the power-law family of potentials, we have explicitly obtained these entropies for the three dimensional Coulomb problem for all values of angular momentum, without recourse to asymptotic expansions. In addition, corresponding results for the classical and semiclassical position and momentum entropies for the reflectionless sech^2 potential and a family of rational potentials have been derived. The analytic results relate the classical period of the motion, total energy, position and momentum entropy, and dependence upon the principal quantum number n. The inclusion of parameters in the various potentials permits the examination of important special cases.

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Date submitted: 29 Nov 2004 Electronic form version 1.4