Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Vacuum State Energies of Anharmonic Potentials by Method of Undetermined Amplitudes SAMUEL P. BOWEN, Chicago State University, JAY D. MANCINI, Kingsborough College of CUNY, VASSILIOS FESSATIDIS, Fordham University — This is an examination of the applications of a method of undetermined amplitudes to the quantization of polynomial potentials leading to the determination of the exact vacuum state energies for several important potentials. The potentials studied include the simple harmonic oscillator (SHO) x^2, x^4, x^{2n}, $\pm x^2 + x^4$, $\pm x^2 + x^6$, $\pm x^2 + x^{10}$ and others. The ground state and vacuum state energies are determined analytically and all have branch point singularities as functions of the coupling parameters and thus cannot be reached by perturbative series expansions. The excited state spectrum must usually be determined numerically, but is determined exactly for the systems where Bohr-Sommerfeld integrals can be solved for the energy.

Vassilios Fessatidis
Fordham University

Date submitted: 08 Nov 2012 Electronic form version 1.4