Abstract Submitted
for the HAW05 Meeting of
The American Physical Society

Zero-point energy corrections in self-consistent calculations with density-dependent forces[1] WALID YOUNES, Lawrence Livermore National Laboratory — Zero-point energy (ZPE) corrections appear naturally in the Gaussian-overlap approximation to the generator-coordinate method, and play a critical role in microscopic calculations of fission. These corrections are obtained through different prescriptions in the literature, and in a seminal paper by Girod and Grammaticos [1], a useful relationship was derived between ZPE corrections calculated with matrix elements of the angular-momentum operator and those of the multipole-moment operator. The derivation assumed a linearly-constrained Hamiltonian, and neglected re-arrangement terms arising from the density dependence of the effective interaction. Both methods of calculating ZPE corrections are commonly used in the literature, but the multipole-moment formalism provides a convenient framework for treating vibrational and rotational ZPE corrections on the same footing. In this talk, the results in [1] are generalized to the case of density-dependent interactions and quadratic constraints. The two methods of extracting ZPE corrections will be compared as a function of deformation for realistic calculations in heavy nuclei.
[1] M. Girod and B. Grammaticos, Nucl. Phys. A330, 40 (1979).

[1]This work was performed under the auspices of the U.S. Department of Energy by the University of California, Lawrence Livermore National Laboratory under Contract No. W-7405-Eng-48

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Date submitted: 25 May 2005 Electronic form version 1.4