Abstract Submitted
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Microscopic Calculation of Excitation Energies for Heavy Systems[1] SAIT UMAR, VOLKER OBERACKER, Vanderbilt University — The density-constrained-TDHF (DC-TDHF) theory is a fully microscopic theory for calculating heavy-ion interaction potentials and fusion cross sections below and above the fusion barrier. The only input into the theory is the effective interaction. The method is based on the TDHF evolution of the nuclear system, coupled with density-constrained Hartree-Fock calculations. This approach incorporates all of the dynamical entrance channel effects such as neck formation, particle transfer, internal excitations and dynamical deformation effects, and has been successfully applied to calculating above- and sub-barrier fusion cross-sections for a number of systems [1-3]. Here, we show that excitations energies of systems formed during heavy-ion collisions can also be microscopically calculated using this approach. Results will be presented for systems, ^{70}Zn+^{208}Pb, ^{48}Ca+^{238}U, and ^{96}Zr+^{132}Sn.

[1] A.S. Umar and V.E. Oberacker, Phys. Rev. C 76, 014614 (2007).
[2] A.S. Umar and V.E. Oberacker, Phys. Rev. C 77, 064605 (2008).
[3] A.S. Umar and V.E. Oberacker, Eur. Phys. J. A 39, 243 (2009).

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