Abstract Submitted
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Fusion, fission, and quasi-fission using TDHF[1] SAIT UMAR, VOLKER OBERACKER, Vanderbilt University — We study fusion, fission, and quasi-fission reactions using the time-dependent Hartee-Fock (TDHF) approach together with the density-constrained TDHF [1] method for fusion. The only input is the Skyrme NN interaction, there are no adjustable parameters. We discuss the identification of quasi-fission in 40Ca+238U, the scission dynamics in symmetric fission of 264Fm, as well as calculating heavy-ion interaction potentials $V(R)$, mass parameters $M(R)$, and total fusion cross sections from light to heavy systems. Some of the effects naturally included in these calculations are: neck formation, mass exchange, internal excitations, deformation effects, as well as nuclear alignment for deformed systems.

[1] Umar and Oberacker, PRC 74, 021601(R) (2006)

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