Abstract Submitted
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TDHF fusion studies including dynamic alignment due to Coulomb excitation[1] VOLKER OBERACKER, SAIT UMAR, Vanderbilt University — We utilize the Time-Dependent Hartree-Fock (TDHF) method to calculate heavy-ion fusion cross sections for systems involving a spherical projectile and a deformed target nucleus. The calculations involve modern Skyrme forces and are carried out on a large 3-D Cartesian lattice using the Basis-Spline collocation method. The computations involve two separate steps: first, a TDHF calculation for a given initial orientation of the deformed nucleus, and secondly a semiclassical time-dependent Coulomb excitation calculation to determine the relative orientation probability of the deformed nucleus near the distance of closest approach. In this paper, we focus on the second aspect of the theory. Specific results will be presented for the light system (^{16}O+^{22}Ne) and for the heavy system ^{64}Ni+^{162}Dy. We demonstrate that in heavier systems the alignment due to multiple E2 and E4 Coulomb excitation is substantial and must be taken into account when calculating the fusion cross section with TDHF. Ref: A.S. Umar and V.E. Oberacker, Eur. Phys. J. A **24** (2005)

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