Pairing effects on fission observable with 3D-Langevin calculation using microscopic transport coefficients.

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Pairing effects are introduced into the current 3D-Langevin calculation from the pairing correction in potential energy surface and microscopic transport coefficients. We compare the fission observables from the calculation with full pairing effects to the results with pairing effects removed only from the transport coefficient.

Keywords: Nuclear Fission, Pairing Effects, Dynamical Calculation

1. Introduction

In the 3D-Langevin calculations with microscopic transport coefficients [1], the random evolution of the shape for the fissioning nucleus are influenced by the potential surface and its transport coefficients. The microscopic transport coefficients on mention here implies the mass and friction tensor calculated from linear response theory [1-2]. In the current paper, we explore the role of pairing effects in microscopic transport coefficients and how it reflects on fission observables.

2. Preliminary Result

Figure (1) compares the TKE of fission fragments for calculations without pairing effects in the transport coefficients. With full pairing effects, we see a pronounced peak at incident neutron energy of 5 MeV which disappears when the pairing effects are removed from transport coefficients. This is primarily due to the differences in the Coulomb repulsion kinetic energy. Since this Coulomb repulsion kinetic energy are calculated from point charge formula, with the charge calculated from UCD, clearly the differences in TKE are due to the Langevin trajectories traversing towards a different scission configuration.

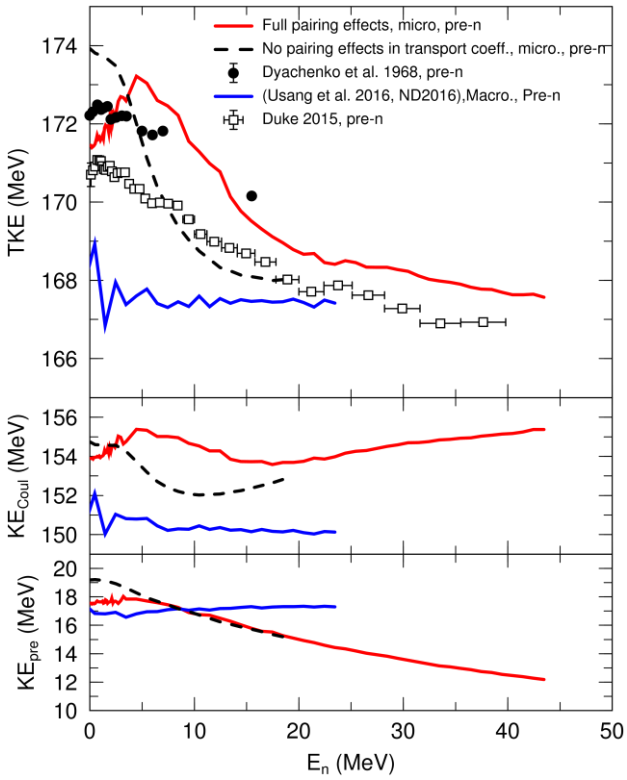

Figure 1: Preliminary results for pairing effects on fission fragments TKE.

References

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