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Microscopic collective inertial masses for nuclear reaction in the presence of nucleonic effective mass

In this talk I would like to introduce to you our study on the collective inertial mass in low-energy nuclear reactions.The inertial mass coefficients with respect to translational, relative and rotational nuclear collective motions are calculated, based on the adiabatic self-consistent collective coordinate (ASCC) method. The impact of the time-odd component of the mean-field potential on the inertial masses are investigated. The same quantities are calculated using other methods including the cranking formulae in the same settings for comparison. We found the inertial masses based on the ASCC method preserve the total nuclear mass for the translational motion as well as the expected asymptotic values for the relative and rotational motions, regardless of the existence of the time-odd component, while the cranking formulae failed to do so once the time-odd interaction is present. The S-factors are calculated with different inertial masses and compared with the conventional results.

Topic

Theory

Author: Dr WEN, Kai (University of Tsukuba, Japan)

Co-author: Prof. NAKATSUKASA, Takashi (University of Tsukuba)

Presenter: Dr WEN, Kai (University of Tsukuba, Japan)

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