



Iranian Journal of Physics Research, Vol. 18, No. 3, 2018

Dynamical study of emitted particles from excited nucleus using Langevin approach

D Naderi and A Farmani

Department of Physics, Faculty of Basic Sciences, Razi University, Kermanshah, Iran

E-mail: d.naderi@razi.ac.ir

(Received 07 May 2016 ; in final form 05 March 2018)

Abstract

Using Langevin dynamics and the dissipative nature of the fission process, we have studied the dynamical variations of nucleus from the formation of the compound nucleus to the separation stage of two fission fragments. During this dissipative process, particles such as neutron, proton, alpha particle and gamma ray were emitted from the compound system. In the present work, the number of emitted particles was calculated using Langevin equation dynamically. The results obtained for emitted alpha particles, protons and neutrons were compared with the experimental data. Also, we have studied the influence of the dissipative coefficient on these quantities. It was found that the dissipative coefficient affected the results; as well, the good agreement between the experimental data and the theoretical results could be reproduced by using the dynamical approach.

Keywords: Langevin dynamics, Monte Carlo simulation, compound nucleus, viscosity coefficient

For full article, refer to the Persian section