

Unusual features in proton and alpha spectra from low-energy heavy-ion reaction

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Nuclear level density (NLD) is a very important physical quantity both from the fundamental and the application point of views. An experimental measurement covering a wide range of excitation energy and angular momentum is necessary and has not been done for many cases. One way of achieving this is to measure angular momentum gated particle spectra in heavy ion fusion reactions.

In this talk I shall present our experimental program on measuring proton and alpha spectra in ^{12}C and ^{16}O induced reactions at low beam energies which favour the compound nuclear reaction process. The measurement of particle spectra covering a high energy range addresses the NLD issue for specific final nuclei. In these measurements, we have encountered some unusual features in the spectra. These features seem to point towards our inadequate knowledge of the excitation energy and angular momentum dependence of NLD in the excitation energy region not very far away from the yrast line. The alpha particle spectra in ^{12}C induced reactions appear to have contribution from other reaction processes also.