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Nuclear fission studies using gas jet transport system

Gas jet transport systems provide access to short-lived fission products and, thus, can help in detailed measurement of members of isobaric chains which is important for understanding the role of different neutron and proton shells in governing the fission mass distribution which has been recently an active area of investigation. Gamma-ray spectrometry after the gas-jet transport is a complementary technique to the on-line mass separation or gamma-gamma coincidence measurement to obtain the information about mass and charge of the fission products which is important for ascertaining the role of neutron and proton shells. In the last few years, experiments have been carried out to study the fission product mass distribution using the gas-jet transport facility at VECC, Kolkata and pneumatic carrier facility at Dhruva reactor, BARC. A detailed comparison of these results with the calculations by the GEF code has been carried out. In this presentation, results from these studies will be discussed. In addition, coupling of the gas-jet transport system with the radiochemical separation can help in the detection and quantification of low yield fission products and can also be useful for decay studies for some of the fission products. Some recent attempts in this direction will also be discussed.

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