

Discrimination between fission and quasi-fission from reaction time measurements

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The so-called quasi-fission process is known to be highly dominant for very heavy systems. However, weak cross-sections of fusion reactions followed by fission (symmetric or asymmetric) can be present, hidden by the huge cross-sections of quasi-fission fragments: both processes can lead to similar final fragments in terms of mass, atomic number, energy and angular distributions. Therefore, the essential difference between the two processes lies in the involved reaction times.

An experimental program has thus been undertaken at Ganil in order to discriminate fusion-fission from quasi-fission processes by investigating their respective reaction times either by the blocking technique in single crystals or by the number of characteristic X-rays from inner-shell vacancies created during the fusion reaction.