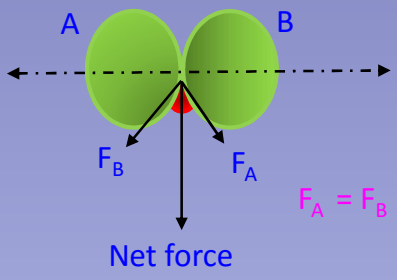
Study of Near-Scission Emission

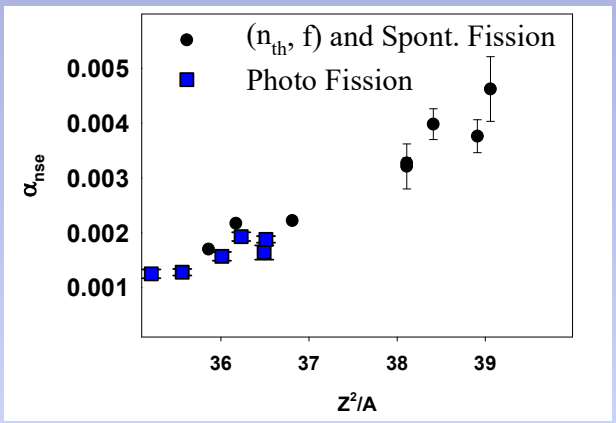


- ❑ Very Sensitive to saddle to scission dynamics
- ❑ Can be used in a wide energy regime from low energy fission to heavy-ion fission

α-particles are measured in coincidence with fission fragments at different relative angles

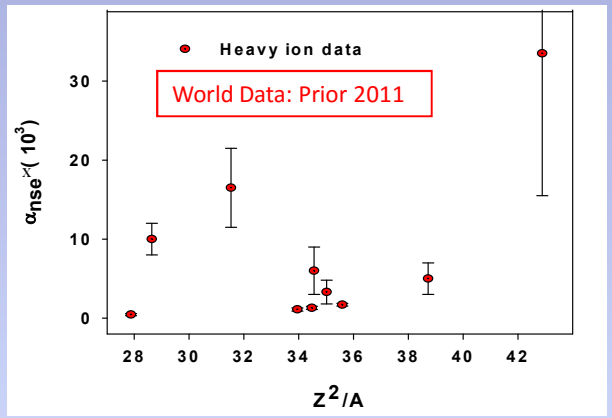
Low Energy Fission Data

In Low energy fission it has been studied quite systematically and emission process is understood to be of dynamical nature.

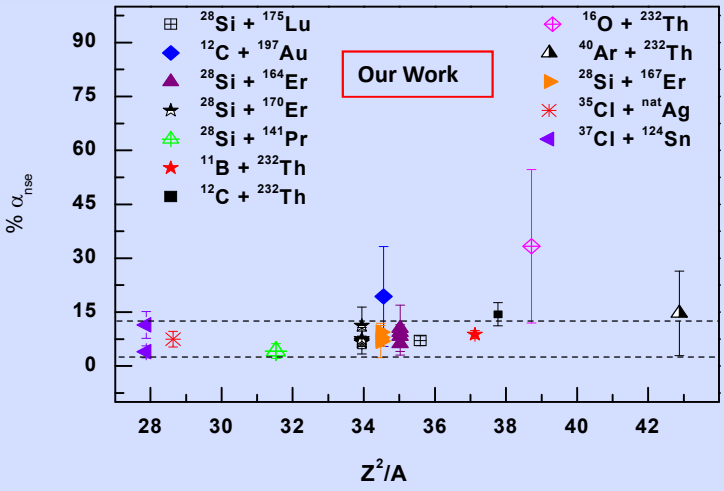


Heavy-ion Fission

In heavy-ion fission it had been debated weather the near scission emission process is a statistical process or a dynamical one?



A program had been initiated at Nuclear Physics Division to resolve this puzzle.



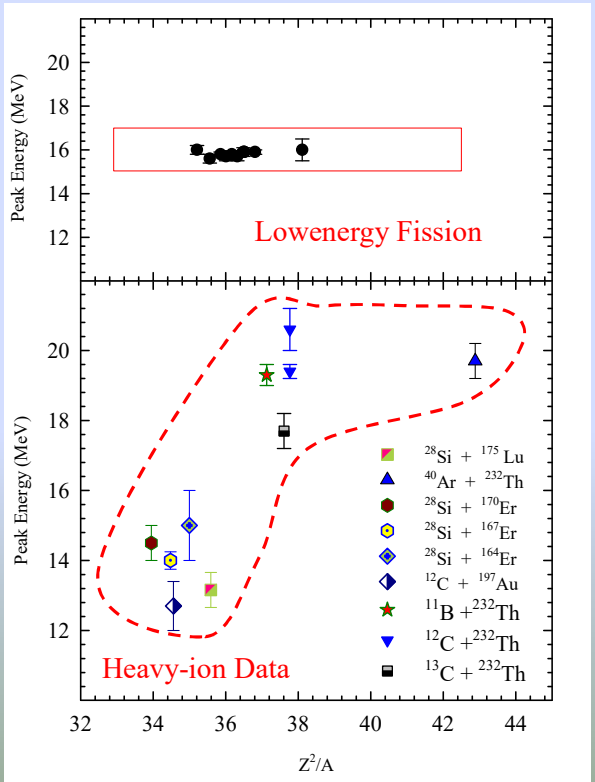
Through several measurements and using existing data it has been established that with increasing energy statistical emission dominates over dynamical one.

It has been demonstrated for the first time that nuclear collective motion exhibits a changeover from a super-fluid to a viscous nature with increasing excitation energy.

Current Interest

The near scission peak energy of the alpha particle energy distribution is very sensitive to nuclear viscosity and heavy-ion fission it is quite scattered.

Several new measurements are being planned to study the near scission peak energy.



Selected publications:

1. Y. K. Gupta et. al. Phys. ReV. C84, 031603(R) (2011)
2. Y. K. Gupta et. al. Phys. Rev. C86, 014615 (2012)
3. Y. K. Gupta et. al. Phys. Rev. C 98, 041601(R) (2018)