Detailed studies of survival probabilities in hot fusion reactions
LIANGYU YAO, RICARDO YANEZ, WALTER LOVELAND, Oregon State University — In the synthesis of new heavy nuclei by hot fusion reactions, the cross section for producing a new heavy nucleus, σ_{EVR}, can be represented as $\sigma_{EVR}(E_{C.M.}) = \sum_{J=0}^{J_{max}} \sigma_{CN}(E_{c.m.}, J) \cdot W_{sur}(E_{c.m.}, J)$ where σ_{CN} is the complete fusion cross section and W_{sur} is the survival probability of the completely fused system. The survival probability is essentially the probability of de-exciting by neutron emission instead of fission. In this work, we are attempting to measure the survival probability, W_{sur}, for the first chance fission of excited Hs nuclei. We form the Hs nuclei using the ^{25,26}Mg $+ {}^{248}$Cm reaction. We measure the neutrons associated with pre-fission emission and those emitted by the fission fragments after fission using six BC501 neutron detectors and six silicon fission fragment detectors. We measure the angular distribution of the emitted neutrons and are able to separate the pre- and post-fission neutrons.

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Date submitted: 11 Sep 2011

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