Abstract Submitted
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Calibration of a Fusion Experiment to Investigate the Nuclear Caloric Curve[1] ASHLEIGH KEELER, None — In order to investigate the nuclear equation of state (EoS), the relation between two thermodynamic quantities can be examined. The correlation between the temperature and excitation energy of a nucleus, also known as the caloric curve, has been previously observed in peripheral heavy-ion collisions to exhibit a dependence on the neutron-proton asymmetry. To further investigate this result, fusion reactions (78Kr + 12C and 86Kr + 12C) were measured; the beam energy was varied in the range 15-35 MeV/u in order to vary the excitation energy. The light charged particles (LCPs) evaporated from the compound nucleus were measured in the Si-CsI(TI)/PD detector array FAUST (Forward Array Using Silicon Technology). The LCPs carry information about the temperature. The calibration of FAUST will be described in this presentation. The silicon detectors have resistive surfaces in perpendicular directions to allow position measurement of the LCP's to better than 200um. The resistive nature requires a position-dependent correction to the energy calibration to take full advantage of the energy resolution. The momentum is calculated from the energy of these particles, and their position on the detectors. A parameterized formula based on the Bethe-Bloch equation was used to straighten the particle identification (PID) lines measured with the dE-E technique. The energy calibration of the CsI detectors is based on the silicon detector energy calibration and the PID. A precision slotted mask enables the relative positions of the detectors to be determined.

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