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**Straggling Effects in the S800 Ion Chamber** JOSEPH GROCHOWSKI, Michigan Technological University, BRAD SHERRILL, DANIEL BAZIN, NSCL, Michigan State University — A detailed investigation of the atomic number resolution of the S800 ion chamber has been performed. Accurate identification of the atomic number of ions resulting from nuclear reactions is essential to separate various reaction products. The main source of uncertainty in the identification of atomic number is energy loss straggling. Experimentally, energy straggling is an observed width of the energy loss distribution as ions traverse matter. To improve the resolution of ion identification, detector straggling must be minimized. First, the sources of straggling must be identified and quantified. An effort has been made to identify and minimize all source of error in the energy loss measurement. The most common source is energy loss straggling. This is the statistical variability in collisions, thus energy losses, as a large number of identical ions pass through matter. Charge exchange straggling is another potential source. This is described as the tendency of an incoming ion to capture a number of electrons, influencing its range through matter. Contributions from the finite momentum acceptance of the S800 and electronic noise were also evaluated. Details of the analysis and techniques to improve the atomic number resolution will be presented.

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