

Abstract Submitted
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A New Gas Ionization Chamber For HELIOS JIANPING LAI, Louisiana State University, HELIOS COLLABORATION, LSU COLLABORATION — The HELIcal Orbit Spectrometer (HELIOS) has become an important tool in studying reactions using radioactive ion beams, and its special design has successfully alleviated problems that arise from studying reactions in inverse kinematics, such as kinematic compression. Here we introduce a new gas ionization chamber, which will significantly improve heavy recoil detection in HELIOS. On one hand, it will help eliminate background by detecting the heavy secondary recoils in coincidence with the light reaction products detected in the silicon detector array; on the other hand, our chamber can tolerate count rates of at least 100 kHz. As a result, a high detection efficiency will be achieved. This design, which functions well with beam rates above 10^5 pps, and obtains a $\delta Z/Z$ resolution better than 2%, will be presented. In addition, we will also show the first test results from this detector, which illustrate the detector's performance. In the future, this detector will be used for radioactive ion beam experiments of interest for nuclear structure and nuclear astrophysics, such as those important for X-ray burst nucleosynthesis.

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