Abstract Submitted
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A high-efficiency Si-detector array for HELIOS[1] B.B. BACK, B. DIGIOVINE, S. HEIMSATH, A.M. JAMES, C.R. HOFFMAN, B.P. KAY, A.M. ROGERS, J.P. SCHIFFER, Argonne National Laboratory, A.H. WUOSMAA, J.C. LIGHTHALL, S.T. MARLEY, Western Michigan University — HELIOS at ATLAS consists of a large superconducting solenoid with its magnetic axis aligned with the beam. Light charged particles emitted from the target are bent in helical orbits back to the axis where their energy and point of impact are measured by a position-sensitive Si-detector array to fully characterize two-body reactions [1]. Using an array assembled from a set of 24 Si wafers from an earlier project, this spectrometer has been in operation since August 2008 [2,3]. We will discuss the challenges in designing a new, optimized Si detector configuration that simultaneously allows for the beam to enter the spectrometer through a large bore in the upstream array, kinematic recoil detection through the bore of the downstream array, liquid cooling of the Si wafers, optimal efficiency, and the possibility of replacing individual Si wafers in the case of failure. [1] A.H. Wuosmaa *et al.*, Nucl. Inst. Meth. A 580, 1290 (2007) [2] B.B. Back *et al.*, Phys. Rev. Lett. 104, 132501 (2010) [3] J.C. Lighthall *et al.*, Submitted to Nucl. Instr. Meth. (May 2010)

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