

Abstract Submitted  
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**Timing Resolution tests of Silicon Photomultipliers for use at the Jefferson Lab**<sup>1</sup> ALEXANDER REUSTLE, The George Washington University, VITALY BATURIN, Thomas Jefferson National Accelerator Laboratory, CLAS 12 COLLABORATION — Silicon Photomultipliers are currently under much scrutiny at the Jefferson Lab. Their small size, and ability to operate unshielded in strong magnetic fields make them ideal for use in particle accelerators. At the Jefferson Lab these SiPMs are slated for possible use in several detector systems in the new 12GeV upgrade. One such project is the Central Time of Flight (CTOF) detector in CLAS Hall B, whose goal is to identify and distinguish between particle species using Timing and Momentum calculations. The Photomultipliers in this detector will experience magnetic fields of up to 5 T and require timing resolutions of 50ps, the smallest of any detector in the lab. Currently this role is filled by Hamamatsu R2083 PMTs, which require robust magnetic shielding. Resolution tests were performed with directed LED light at various frequencies and intensities. The SiPMs were found to have a resolution of 76ps at usable surface areas, 50% greater than the required maximum of 50ps for CTOF, but well below that necessary for other detector systems, such as the Central Neutron Detector and Photon Tagger arrays.

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Alexander Reustle  
The George Washington University

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