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High-precision measurement of the light response of BC-418 plastic scintillator to protons with energies from 100 keV to 10 MeV VLADIMIR HENZL, BRIAN DAUB, JENNIFER FRENCH, JUNE MATTHEWS, Massachusetts Institute of Technology, MICHAEL KOVASH, University of Kentucky, STEPHEN WENDER, Los Alamos National Laboratory, MICHAEL FAMI-ANO, Western Michigan University, KATRINA KOEHLER, MARK YULY, Houghton College, NY — The determination of the light response of many organic scintillators to various types of radiation has been a subject of numerous experimental as well as theoretical studies in the past. But while the data on light response to particles with energies above 1 MeV are precise and abundant, the information on light response to very low energy particles (i.e. below 1 MeV) is scarce or completely missing. In this study we measured the light response of a BC-418 scintillator to protons with energies from 100 keV to 10 MeV. The experiment was performed at Weapons Neutron Research Facility at LANSCE, Los Alamos. The neutron beam from a spallation source is used to irradiate the active target made from BC-418 plastic scintillator. The recoiled protons detected in the active target are measured in coincidence with elastically scattered incident neutrons detected by and adjacent liquid scintillator. Time of flight of the incident neutron and the knowledge of scattering geometry allow for a kinematically complete and high-precision measurement of the light response as a function of the proton energy.

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