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Studies of single-photoelectron response and of performance in high magnetic field of a multianode H8500C-03 photomultiplier tube SIMONA MALACE, BRADLEY SAWATZKY, Jeffesron Lab, HAIYAN GAO, Duke University — Several approved experiments at Jefferson Laboratory for the 12 GeV era will require threshold Cerenkov detectors to function optimally in high magnetic field, up to 250 Gauss. A magnetic field resistant photon detector with good resolution for single photoelectron signals is necessary for the proper functionality of such Cerenkov detectors. We recently performed extensive studies of single photoelectron response and of performance in high magnetic field (up to 300 gauss) of the multianode photomultiplier tube H8500C-03. We mapped in great detail the effect of a longitudinal and transverse high magnetic field on both large signals, up to 60 photoelectrons, and on single photoelectron signals. We were thus able to disentangle the loss of photoelectrons extracted from the photocathode which would lead to the loss of an event from the losses during the amplification stage on the dynode chain which could be corrected by use of external amplification. Our measurements show that H8500C-03 is a viable choice for an efficient detection of Cerenkov photons in a high magnetic field environment.

Simona Malace
Jeffesron Lab

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