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Cherenkov and scintillation light separation on the CheSS experiment JAVIER CARAVACA, BENJAMIN LAND, FREIJA DESCAMPS, GABRIEL D. OREBI GANN, Univ of California - Berkeley — Separation of the scintillation and Cherenkov light produced in liquid scintillators enables outstanding capabilities for future particle detectors, the most relevant being: particle directionality information in a low energy threshold detector and improved particle identification. The CheSS experiment uses an array of small, fast photomultipliers (PMTs) and state-of-the-art electronics to demonstrate the reconstruction of a Cherenkov ring in liquid scintillator using two techniques: based on the photon density and using the photon hit time information. A charged particle ionizing a scintillation medium produces a prompt Cherenkov cone and late isotropic scintillation light, typically delayed by several ns. The fast response of our PMTs and DAQ provides a precision well below the ns level, making possible the time separation. Furthermore, the usage of the new developed water-based liquid scintillators (WbLS) enhances the separation since it allows tuning of the Cherenkov/Scintillation ratio. Latest results on the separation for pure liquid scintillators and WbLS will be presented.

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