

Abstract Submitted
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Cosmic Ray Water Cherenkov Detector MARTIN REYES JR.,
YESSICA TORREZ HERNANDEZ, Hartnell College — Cosmic rays are high energy particles that travel through space and shower Earth. Cherenkov radiation consists of electromagnetic radiation that is produced when remnants of scattering cosmic rays travel through earth's atmosphere and surpass the speed of light in a material medium. The equation, $\cos\theta = 1/\beta\eta$, dictates the cone shaped light effect where β is equal to the velocity of the particle divided by velocity of light through a vacuum and η being the refractive index of the medium. Our research project was to create simple and reliable Cherenkov detectors for use to outreach to high school STEM students. For this, we used two modified thermos bottles with distilled water as the medium to produce Cherenkov radiation. To observe the Cherenkov radiation from cosmic rays, two Photomultiplier detectors (PMT) were used and each was submerged in a thermos bottle and covered with light tight foils. Extensive evaluations were done for various placements of the detectors in both the vertical and the horizontal directions to obtain coincidence cosmic ray events. Results from our experiments indicated that the thermos detectors were detecting Cherenkov radiation produced by cosmic particles.

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