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A Novel Particle Detector: Quantum Dot Doped Liquid Scintillator LINDLEY WINSLOW, JANET CONRAD, Massachusetts Institute of Technology, RUEL JERRY, Howard University — Quantum dots are semiconducting nanocrystals. When excited by light shorter then their characteristic wavelength, they re-emit in a narrow band around this wavelength. The size of the quantum is proportional to the characteristic wavelength so they can be tuned for many applications. CdS quantum dots are made in wavelengths from 360nm to 460nm, a perfect range for the sensitivity of photo-multiplier tubes. The synthesis of quantum dots automatically leaves them in toluene, a good organic scintillator and Cd is a particularly interesting material as it has one of the highest thermal neutron cross sections and has several neutrinoless double beta decay and double electron capture isotopes. The performance of quantum dot loaded scintillator compared to standard scintillators is measured and some unique properties presented.

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