Contribution ID : **117** Type : **not specified**

Study of the low-background Hamamatsu R11410-20 cryogenic PMTs for the RED100 detector

Wednesday, 7 October 2015 16:15 (15)

The two-phase cryogenic xenon emission detector RED100 is planned to be equipped by 38 Hamamatsu R11410-20 photomultiplier tubes, which are claimed to be operable at cryogenic temperatures and made of extremely low background materials. A thorough characterization procedure has been carried out for each PMT unit to be installed to the detector. The main results obtained are presented here, including the single photoelectron spectra parameters, a set of gain-representing curves for a wide range of the bias voltage values, typical amplitude integral spectrum of the PMT's dark count rate and the distribution of 34 PMT samples through their dark count rate for equal gain values. Peculiar characteristics of several PMT units are further discussed and explained.

Presentation type

Section talk (10+5 min)

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Session Classification : Nuclear physics and particle physics - parallel VIII

Track Classification : Nuclear physics and particle physics