

XVI Neutrino Telescopes Workshop
Palazzo Franchetti - Venice, 2-6 March 2015

Poster Session – Submission of Abstract

Submitter: Yaping Cheng, Institute of High Energy physics ,chengyp@ihep.ac.cn

Author: Yaping Cheng, ...

Title of the Poster: Determination of Supernovae Direction with Reconstructed Positron Information

Abstract Text:

The supernova (SN) is assumed as the explosion in the final stage of the stellar evolution. Determination of a SN explosion direction is essential for both early stage astronomical observations and optically invisible SN. Jiangmen Underground Neutrino Observatory (JUNO) has 20 kton liquid scintillator as target, equipped with more than 18000 PMTs, which provides good opportunity for SN detection. In this poster, an algorithm was described to reconstruct positron track in liquid scintillator detectors by using the Cherenkov light. Then SN direction is calculated by quasi-elastic kinetics using the positron direction information. The challenge is to distinguish Cherenkov light from scintillation, due to the PMT timing resolution, dark noise, etc. The performance of this algorithm will be discussed for detecting a typical SN at 10 kpc in the JUNO detector. We see improvements in direction determination by this method compared with method described in Phys. Rev. D 61 (1999) 012001.

Summary:

Liquid Scintillator Detector; Positron track; Supernovae; Reconstruction; Simulation;