

A complete PMT optical model for JUNO

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The Jiangmen Underground Neutrino Observatory (JUNO) is a multi-purpose experiment designed to determine the neutrino mass ordering and precisely measure neutrino oscillation parameters. JUNO is the world's largest liquid scintillator detector instrumented with 17,612 20-inch photomultiplier tubes (PMTs). It is critical to develop an accurate optical model for the PMTs within their working media in order to describe the photon detection efficiency (PDE) at any incident angle and photon wavelength. This poster reports in detail how a combination of simulation and measurements were used to establish the JUNO PMT Optical model. The model relates the PDE to the underlying optical processes using a transfer-matrix method (TMM) thin film calculation that depends on thicknesses and complex refractive indices of the photocathode and anti-reflective coatings of the PMTs.

Poster prize

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