

The Wavelength-shifting Optical Module (WOM) for the IceCube Upgrade

Tuesday 13 July 2021 18:00 (12 minutes)

The Wavelength-shifting Optical Module, or WOM, is a novel optical sensor that uses wavelength shifting and light guiding to substantially enhance the photosensitive area of UV optical modules. It has been designed for the IceCube Upgrade, a seven-string extension of the IceCube detector planned for the 2023/2024 South Pole deployment season, but its design can be applied to any large particle detector based on the detection of Cherenkov light. The WOM consists of a hollow quartz cylinder (detection area) coated in wavelength shifting paint with two PMTs attached to the end faces of the cylinder. The light-collecting quartz increases the effective photocathode area of the light sensors without producing additional dark current, making it suitable for low-signal, low-noise applications. For larger event distances where UV absorption shifts the spectrum to longer wavelengths, the design can be augmented with PMTs. We will report on the design and performance of the WOM with a focus on the 12 modules in production for deployment in the IceCube Upgrade.

Keywords

Photosensors, IceCube Upgrade

Collaboration

IceCube

other Collaboration

Subcategory

Experimental Methods & Instrumentation

Primary authors: RACK-HELLEIS, John (JGU Mainz); Dr POLLMANN, Anna (Universität Wuppertal); FOR THE ICECUBE COLLABORATION

Presenter: RACK-HELLEIS, John (JGU Mainz)

Session Classification: Discussion

Track Classification: Scientific Field: NU | Neutrinos & Muons