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Hybrid optical modules for IceCube Extensions

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Novel optical sensor design decouples the photo-sensitive area from the PMT cathode area. Light guides can be shaped in a more favourable geometry for the target detector.

Twelve wavelength shifting optical modules (WOMs) will be deployed in the IceCube Upgrade.

The photo-sensitive area is a long cylinder coated with wavelength shifting paint which exploits the UV part of the Cherenkov spectrum that is read out with two PMTs.

Compared to classic modules the overall noise is significantly decreased which provides various applications for this new device.

The successor of the WOM is the Advanced Cylindrical Optical Module (ACOM) for IceCube Gen2 which comprises of additional PMTs for timing and directional information. Also dichroic filters are investigated in order to improve the light collection efficiency.

The design and performance of the WOM as well as the concepts for the ACOM will be presented.

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