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The development of multi-PMT optical modules with photonic readout for KM3NeT

Abstract content

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- Title of the paper: The development of multi-PMT optical modules with photonic readout for KM3NeT
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- Ordered list of authors with institution affiliations C. Colnard, E. Heine, M. van der Hoek, J. Hogenbirk, M. de Jong, P.M. Kooijman, S. Mangano, H. Peek, E. Presani, G. van der Steenhoven, E. de Wolf, Nationaal Instituut voor Kernfysica en Hoge-Energiefysica (NIKHEF), P.O. Box 41882, 1009 DB Amsterdam, The Netherlands
- Abstract text (max. 200 words):

Neutrino telescopes wil provide a new window on the universe provided that their sensitive area is sufficiently large. In order to improve the performance-to-cost ratio of deepsea km^3-sized neutrino telescopes, a novel concept for the optical module (and its readout) of such instruments has been developed. Rather than using a few large area photomultiplier tubes (PMTs) a pressure sphere housing up to 40 small standard PMTs is being developed. Moreover, the readout of these PMTs will be based on the direct conversion of the PMT output into a photonic signal using a novel low-power large bandwidth electro-optical modulator. Using such a system there is no need to built expensive deepsea containers housing the local readout electronics. Monte Carlo Simulations indicate that the acceptance of such a multi-PMT optical module is superior to that of the tradiational design. A first prototype of the proposed optical module has been built and first test results will be presented. Because of the large bandwidth of modern DWDM systems, the proposed design will also enable to transport all PMTs signals to the readout station on shore. This has the advantage that flexible (software-based) physics triggers can be used.

If this papers is presented for a collaboration, please specify the collaboration

Summary

Reference

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