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The optical modules for the 8 towers of the KM3NeT-Italia project

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The KM3NeT European experiment aims to construct a large volume underwater neutrino telescope, to be installed in the depths of the Mediterranean Sea. Thanks to a dedicated funding provided by the Italian Ministry of Education, University and Research (MIUR) with PON 2007-2013 resources, in a first phase, commonly referred as KM3NeT-Italia, an 8-towers detector will be constructed, that shares the same technology of the previously NEMO Phase-2 towers, but with some important variations: the number of optical modules per floor will be 6, the number of floors per tower will be 14, interleaved by 20 m and the towers will be spaced by a mean distance of 120 m.

The detection element of the telescope, the optical module, will be composed by a 13-inch high-pressure glass-vessel that contains a single 10-inch photomultiplier (PMT), optically and mechanically coupled by means of a transparent silicon gel. A mu-metal cage surrounds the PMT to shield it against the Earth's magnetic field. The power supply system, the front-end electronic module and a LED-system designed for underwater calibrations are also hosted into the glass sphere.

The optical modules mass production phase started some months ago and will be entirely performed in the INFN-LNS site in the harbour of Catania. Over 700 photomultipliers have been tested by means of a dedicated test bench, and over 100 optical modules have been fully assembled and tested, ready for the next deployment phases.

In the proposed talk, the optical module layout and its components will be described in details, and the main results from the massive photomultipliers measurements will be also presented. In order to share information for next mass productions, the main assembly procedure phases will be also highlighted.

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