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New measurements on an improved 3” Hamamatsu photomultiplier for the KM3NeT Neutrino Telescope

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The KM3NeT experiment is a neutrino telescope which makes use of photomultiplier tubes to detect the Cherenkov radiation emitted by charged particles.

The first interaction of this light with the detector occurs at the photocathodes of the photomultiplier tubes, is then of primary importance to have the most complete characterisation of these elements.

An improved version of the former R12199-02 model by Hamamatsu, named R14374-02, will be used until the completion of the experiment.

In this study we characterise one thousand of PMTs for the timing properties, dark rate and pulse response by using a dedicated apparatus.

We report the quantum efficiency response spectrum for two hundred elements and we compare it with the one provided at two wavelengths by the producer. This study will provide a statistically solid measurement of a quantity that is important and required for the numerical simulations of the detector response.

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