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Monte Carlo simulation studies of the timing calibration accuracy required by the NEMO underwater neutrino telescope

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The results of Monte Carlo simulation studies of the timing calibration accuracy required by the NEMO underwater neutrino telescope are presented. The NEMO Collaboration is conducting a long term R&D activity toward the installation of a km³ apparatus in the Mediterranean Sea. An optimal site has been found and characterized at 3500 m depth off the Sicilian coast. Monte Carlo simulation shows that the angular resolution of the telescope remains approximately unchanged if the offset errors of timing calibration are less than 1 ns. This value is tolerable because the apparatus performance is not significantly changed when such inaccuracies are added to the other sources of error (e.g., the accuracy position of optical modules). We also discuss about the optical background rate effect on the angular resolution of the apparatus.

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