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Cascade sensitivity studies for KM3NeT

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KM3NeT is a future research infrastructure in the deep sea of the Mediterranean, hosting the next generation neutrino telescope. The instrumented volume of the telescope, of several cubic kilometers, will be split up in six smaller building blocks. The construction of the first phase of the telescope is in progress. The next step, internally named KM3NeT Phase 1.5, is to realize the first two building blocks in response to the observation of high energy neutrino events coming from outside the Earth atmosphere recently reported by the IceCube Collaboration; these signal events are expected to be originated by an all flavor isotropic cosmic neutrino flux with an energy cutoff at few PeVs. In the context of KM3NeT Phase 1.5, several efforts have been made to understand the sensitivity of a cubic kilometer neutrino telescope in the Mediterranean Sea to these events. In this contribution, I present some preliminary results on sensitivity studies directed to the observation of such a signal in the neutrino cascade channel, originating from all neutrino interactions but ν_{μ} CC. A 50% discovery at 5σ level of a signal flux analogous to the one reported by the IceCube Collaboration can be obtained with ~ 1.5 years operation of the KM3NeT Phase 1.5 detector with two building blocks in the Mediterranean Sea, with a total instrumented volume of about 1 km³.

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