

The Case for a Large Scale Underwater Neutrino Telescope

(For the KM3NeT collaboration)

The KM3NeT consortium has completed a Technical Design Report (TDR) for a proposed multi-cubic-kilometer sized underwater neutrino telescope that will be deployed in the Mediterranean Sea. Highlights of the contents of the TDR will be presented in three poster presentations. In this first of three presentations we will focus on the physics case for the KM3NeT.

The physics reach of a large scale underwater neutrino telescope in the Mediterranean (the KM3NeT) will be described. The proposed device will be able to detect neutrinos interacting in the nearby sea water or the underlying sea floor that have energies above 100 GeV. We have performed extensive MC simulations of its behavior to determine its sensitivity to various neutrino sources. The sensitivity to galactic or extragalactic point sources of neutrinos, to neutrinos associated with GRBs, and to any diffuse flux of cosmic neutrinos will be shown and compared to the reach of the currently operating IceCube telescope. In addition the capability of the KM3NeT for detecting dark matter candidate particles (WIMPs, neutralinos, ...) through their annihilation into neutrinos will also be shown.

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