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Offline perfomance studies and first real-time results on CCSN neutrinos searches with the KM3NeT neutrino detectors

The KM3NeT collaboration has started the building of the ARCA and ORCA neutrino telescopes in the Mediterranean Sea. Both detectors can be used to detect core-collapse supernova neutrino bursts, exploiting correlations in the signals recorded by the 31 directional PMTs of the KM3NeT Digital Optical Modules. With the most recent data from the deployed lines, the supernovae detection algorithm and its implementation as a real time trigger have been refined and tested to be robust and effective. The first results are presented here. The expected sensitivities to the neutrino energy spectrum and time profile have also been evaluated.

In addition, new approaches for the determination of the arrival time of the neutrinos at different neutrino detectors using the experimental light-curves is described. The combination of the estimations for currently running and near future neutrino detectors allows to triangulate the supernova direction in the sky.

Mini-abstract

Perfomance studies and first real-time results on CCSN neutrinos searches with the KM3NeT detectors

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