

## Journées de Rencontre Jeunes Chercheurs 2023



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# Deeply Learning from Neutrino Interactions with the KM3NeT neutrino telescope

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KM3NeT/ORCA is a large-volume water-Cherenkov neutrino detector, under construction at the bottom of the Mediterranean Sea at a depth of 2450 meters. The main research goal of ORCA is the measurement of the neutrino mass ordering and the atmospheric neutrino oscillation parameters. Additionally, the detector is also sensitive to a wide variety of phenomena including non-standard neutrino interactions, sterile neutrinos, and neutrino decay.

This contribution is divided in two parts. First, the use of a machine learning framework for Deep Neural Networks (DNN) which combine multiple energy estimates to generate a more precise reconstructed neutrino energy. Second, the implementation of Graph Neural Networks (GNN) as for multipurpose event reconstructions. Both approaches show how Neural Networks can outperform current reconstructions and have a positive impact on the sensitivities of oscillation parameters.

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