Executive summary

Deep learning reconstruction of the neutrino energy with a shallow Askaryan detector

What is this contribution about?

Deep-learning based reconstruction of the neutrino energy from radio detector data (1e17eV-1e19eV).

Why is it relevant / interesting?

We present the first end-to-end reconstruction of the neutrino energy for a shallow radio detector station.

What have we done?

A deep neural network was designed and trained to predict the neutrino energy. We used the NuRadioMC code to create the required large training data sets.

What is the result?

Directly from raw data without any additional information, the neural network predicts the shower energy with 80% resolution. This is lower than the intrinsic uncertainty from unknown inelasticity when converting shower to neutrino energy.