Poster session 1 - Monday 4 July

P1.002 **Particle identification in KM3NeT/ARCA**

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on behalf of KM3NeT collaboration

KM3NeT is a large research infrastructure consisting of a network of deep-sea neutrino telescopes. ARCA will be the instrument detecting high-energy neutrinos with energies above ~ 1 TeV. This instrument gives a new opportunity to observe the neutrino sky with very high angular resolution to be able to detect neutrino point sources. Furthermore it will possible to probe the flavor composition of neutrino fluxes, and hence production mechanisms, with so far unreached precision. Neutrinos produce different event topologies in the detector according to their flavor, interaction channel and deposited energy. Machine learning algorithms are able to learn features of topologies to discriminate them. In previous analyses only two event types were regarded, namely the shower and track topology. With high timing resolution and precise reconstruction algorithms it is possible to separate into more event types, for example the double bang topology produced by tau neutrinos. The final goal is to separate all three neutrino flavors as much as possible. To resolve this issue the KM3NeT collaboration uses deep neural networks trained with Monte Carlo events of all neutrino types. This contribution shows the ability of KM3NeT/ARCA to classify events in more than two neutrino event topologies. Further the borders between detectable classes are shown, like the minimum distance the tau has to travel before decaying in a tau neutrino event to be detected as double bang event.