

# Charm Hadron Induced Double Cascades in Neutrino Telescopes

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Neutrino telescopes see events of various morphologies: these are the shapes of the aggregate photon hits recorded by the optical module array, including electron neutrino-induced cascades, muon neutrino-induced tracks, and many more. Among these event morphologies, the double cascade ("double-bang") is a class of particular interest because it might indicate the detection of a tau neutrino. However, there are more exotic processes that might lead to a double-bang-like signature, among which is the production and subsequent decay of charmed hadron. In this study, we simulate neutrino-nucleus Deep Inelastic Scattering-induced charmed hadron production, its decay, and the corresponding detector response. We analyze the morphology of such a class of events in a comparison with tau neutrino-induced double-bang signatures, focusing on our ability to reconstruct and differentiate the two processes.

## Poster prize

Yes

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