

# Potassium Decay Noise Modeling for the Pacific Ocean Neutrino Explorer (P-ONE)

*Friday, 12 February 2021 12:00 (15)*

Recent observations by neutrino observatories such as IceCube have thoroughly cemented the research potential of neutrino astronomy. The Pacific Ocean Neutrino Explorer (P-ONE) is a proposed initiative to construct one of the largest neutrino telescopes deep in the northern Pacific Ocean off the coast of British Columbia. The detector itself will consist of an array of strings lined with digital optical modules (DOMs) for detecting Cherenkov light induced by neutrino interactions. Two Pathfinder missions have been deployed in order to study the optical properties of the seawater including scattering and absorption lengths as well as noise. As part of this analysis, the ambient background activity produced by Cherenkov light from the decay of natural  $^{40}\text{K}$  in saltwater needs to be characterized. This presentation will detail the modeling process of the undersea environment and detector DOMs using Geant4 while also verifying simulation data against in situ measurements to obtain a full understanding of the  $^{40}\text{K}$  background. Not only is this an important step of the site characterization that will serve to improve future event trigger development, but accurate modeling of ambient  $^{40}\text{K}$  will also prove to be useful for detector efficiency measurement and recalibration.

## email address

[jakubs@sfu.ca](mailto:jakubs@sfu.ca)

## Please select: Experiment or Theory

Instrumentation

**Primary author(s)** : Mr STACHO, Jakub (Simon Fraser University)

**Presenter(s)** : Mr STACHO, Jakub (Simon Fraser University)