UNIVERSITY OF DELAWARE
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Contribution ID: **10** Type: **Talk**

In-situ pulser depth reconstruction for RNO-G using Neural Network

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Radio Neutrino Observatory in Greenland (RNO-G) aims to detect Askaryan emission from ultra-high energy astrophysical and cosmogenic neutrinos above 10 PeV. Situated at Summit Station, it is proposed to have 35 stations of which 7 stations have been installed so far. Search for neutrinos and their direction reconstruction using interferometry requires precise control of parameters such as antenna positions and an accurate ice model. Various known sources are available in and around the RNO-G stations which can be used in calibration of the observatory. In-situ calibration pulsers deployed on helper strings in each station along with pulser drops performed for some stations allow us to constrain the uncertainty in antenna position and test the accuracy of our ice model.

In my poster I assume a simple straight line, plane wave approximation and ignore ray-bending as an initial guess to reconstruct the depth of the stationary pulsers in 14 helper strings across 7 stations. The station geometry allows this simple model to be a good approximation and I use the stationary pulser data to train my neural network, allowing me to reconstruct pulser depths in cases where ray-bending effects might be more significant (such as pulser drops). This method is preferred as it's much faster than analytical raytracting or simulating radio propagation.

Type of Contribution

poster / flash talk (for work in progress)

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