UNIVERSITY OF DELAWARE
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Contribution ID: **18** Type: **Talk**

A Simulation-Based Inference Method for Electric Field Reconstruction (Remote)

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The primary goal of the Giant Radio Array for Neutrino Detection (GRAND) is to uncover the mysterious sources of ultra-high-energy cosmic rays (UHECRs). GRAND aims to achieve this by detecting electric fields generated by UHECR interactions with Earth's atmosphere and magnetic field. Reconstructing the electric field from measured antenna voltages is difficult due to the need for a detailed model of the antenna's response and background noise.
We will present a simulation-based inference model trained to learn the likelihood ratio using realistic simulations from CoREAS and ZHAireS. The model incorporates a realistic antenna response and Galactic background noise to accurately reconstruct the electric field. Additionally, we will introduce various statistical tests, such as coverage tests, to demonstrate the statistical validity of our findings.

Type of Contribution

poster / flash talk (for work in progress)

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Session Classification: Talks