Contribution ID: **658**   Type: **Poster**

Event Reconstruction Performance for SWGO using Attention-based Neural Network

The Southern Wide-field Gamma-ray Observatory (SWGO) is a proposed next-generation TeV gamma-ray observatory and the first wide-field experiment dedicated to exploring the southern gamma-ray sky. In this study, we present DeepEASTER (Deep learning for Extensive Air Shower Targeted Event Reconstruction), an attention-based neural network designed to optimize event reconstruction for SWGO. The structure is inspired by the Transformer Encoder architecture, but DeepEASTER replaces self-attention with latent attention, significantly reducing computational costs while maintaining high performance.

DeepEASTER is an end-to-end reconstructor, directly taking the calibrated photomultiplier tube (PMT) signals, which provide a gain and relative trigger time for each PMT, as input to predict incoming direction, energy, core position, and particle type. Our results demonstrate that DeepEASTER outperforms algorithmic reconstruction methods, underscoring the potential of deep learning for ground-based gamma-ray observatories.

Collaboration(s)

SWGO

Authors: WATSON, Ian James (University of Seoul); SON, Youngwan (University of Seoul (KR))

Presenter: WATSON, Ian James (University of Seoul)

Session Classification: PO-2

Track Classification: Gamma-Ray Astrophysics