

# Studies of Gamma Ray Shower Reconstruction Using Deep Learning

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The ALTO project aims to build a particle detector array for very high energy gamma ray observations optimized for soft spectrum sources. The accurate reconstruction of gamma ray events, in particular their energies, using a surface array is an especially challenging problem at the low energies ALTO aims to optimize for. In this contribution, we leverage Convolutional Neural Networks (CNNs) to improve reconstruction performance at lower energies ( $< 1$  TeV) as compared to the SEMLA analysis procedure, which is a more traditional method using mainly manually derived features.

We present performance figures using different network architectures and training settings, both in terms of accuracy and training time, as well as the impact of various data augmentation techniques.

## Keywords

gamma-rays, very-high energies, atmospheric showers, machine learning, analysis methods

## Collaboration

## other Collaboration

## Subcategory

Experimental Methods & Instrumentation

**Primary author:** BYLUND, Tomas (Linnaeus University)

**Co-authors:** KUKEC MEZEK, Gašper (Linnaeus University); SENNIAPPAN, Mohanraj (Linnaeus University); BECHERINI, Yvonne; PUNCH, Michael (Astroparticule et Cosmologie (APC), CNRS & Linnaeus University)

**Presenter:** BYLUND, Tomas (Linnaeus University)

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