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Type: Parallel Talk

## Identification of Beam Particles Using Detectors based on Cerenkov effect and Machine Learning in the COMPASS Experiment at CERN

*Friday, 8 July 2022 12:30 (15 minutes)*

Cerenkov Differential counters with Achromatic Ring focus (CEDARs) in the COMPASS experiment beamline were designed to identify particles in limited intensity beams with divergence below  $65\mu\text{rad}$ . However, in the 2018 data taking, a beam with a 15 times higher intensity and a beam divergence of up to  $300\mu\text{rad}$  was used, hence the standard data analysis method could not be used. A machine learning approach using neural networks was developed and examined on multiple Monte Carlo simulations. Different types of network were tested and their configurations optimized using a genetic algorithm with the best performing model being integrated into the current data analysis software written in C++.

### In-person participation

Yes

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**Session Classification:** Computing and Data handling

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