

# Generative modeling with Graph Neural Networks for the CMS HGCal

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In high energy physics, detailed and time-consuming simulations are used for particle interactions with detectors. For the upcoming High-Luminosity phase of the Large Hadron Collider (HL-LHC), the computational costs of conventional simulation tools exceeds the projected computational resources. Generative machine learning is expected to provide a fast and accurate alternative. The CMS experiment at the LHC will use a new High Granularity Calorimeter (HGCal) to cope with the high particle density. The new HGCal is an imaging calorimeter with a complex geometry and more than 3 million cells. We report on the development of a GraphGAN to simulate particle showers under these challenging conditions.

**Primary authors:** KRUECKER, Dirk (CMS (CMS Fachgruppe Searches)); EREN, Engin (FLC (FTX Fachgruppe SFT)); GAEDE, Frank (FTX (FTX Fachgruppe SFT)); KASIECZKA, Gregor (UNI/EXP (Uni Hamburg, Institut fur Experimentalphysik)); SCHAM, Moritz (CMS (CMS Fachgruppe Searches)); WOLF, Moritz (UNI/EXP (Uni Hamburg, Institut fur Experimentalphysik)); MCKEOWN, Peter (FTX (FTX Fachgruppe SFT)); BEIN, Samuel (UNI/EXP (Uni Hamburg, Institut fur Experimentalphysik)); BHATTACHARYA, Soham (CMS (CMS Fachgruppe Searches)); KORCARI, William (UNI/EXP (Uni Hamburg, Institut fur Experimentalphysik))

**Presenter:** SCHAM, Moritz (CMS (CMS Fachgruppe Searches))