Contribution ID: **172**   Type: **Poster (Session B)**

FLUKA Monte Carlo Simulations and Benchmark Measurements for the LHC Beam Loss Monitors

One of the crucial elements in terms of machine protection for CERN's Large Hadron Collider (LHC) is its beam loss monitoring (BLM) system. Online loss measurements must prevent the superconducting magnets from quenching and protect the machine components from damages due to unforeseen critical beam losses. In order to ensure the BLM's design quality, in the final design phase of the LHC detailed FLUKA Monte Carlo simulations were performed for the betatron collimation insertion. To define the dynamic range and to derive the final calibration factors of the BLM detectors, the FLUKA results were folded with response functions calculated with GEANT4. In addition, independent GEANT4 simulations were performed using the particles entering the BLM (calculated with FLUKA) as a source, in order to derive the correct detector signal and calibration. This paper presents results of FLUKA calculations performed for BLM's installed in the collimation region. In addition, benchmark measurements with BLM's installed at the CERN-EU high-energy Reference Field facility (CERF) are compared to respective FLUKA simulations. This, together with the fact that the CERF source spectra at the respective BLM locations are comparable with those at the LHC, successfully confirms the accuracy needed for the performed LHC design studies.

Primary author: SARCHIAPONE, Lucia (Unknown)

Presenter: SARCHIAPONE, Lucia (Unknown)