

## Early Physics with the LHCf detector at LHC

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The LHCf detector is ready to take data at the LHC accelerator at CERN. The whole detector has been installed at the beginning of 2008 on both side of LHC collision point 1 (IP1) and the commissioning phase is in a well advanced stage. Thanks to the excellent energy and position resolution of the two sampling calorimeters, LHCf will be able to measure the pion production cross section at a very small angle in p-p interactions up to 14 TeV in the center of mass system through the measurement of the photons produced in the neutral pion decay. It will also be able to identify neutrons and measure their energy spectrum. LHCf will thus provide a good calibration of the various shower models that are widely used to estimate the primary energy of ultra-high-energy cosmic rays. Many of the experimental procedures used to derive the energy spectra of the incoming cosmic rays depend strongly on the nuclear interaction model used in the Monte Carlo codes of the air showers and several open questions in cosmic ray physics may profit from the accurate knowledge and calibration of Monte Carlo models provided by the LHCf experiment.

**Primary author:** Dr ALESSIA, Tricomi (University and INFN Catania)

**Presenter:** Dr ALESSIA, Tricomi (University and INFN Catania)

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