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Early Physics with the LHCf detector at LHC

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The LHCf detector is the smallest of the six experiments which are taking data at the CERN LHC accelerator. The whole detector has been installed at the beginning of 2008 on both sides of LHC collision point 1 (IP1). LHCf has been designed to measure with high accuracy energy and transverse momentum spectra of neutral particles in the very forward region ($\eta > 8.4$) of LHC collisions by means of a double arm calorimeter. Thanks to the excellent energy and position resolution of the two sampling calorimeters, LHCf is able to measure the pion production cross section through the measurement of the photons produced in the neutral pion decays. It is also able to identify neutrons and measure their energy spectrum. LHCf data provide a fundamental tool to calibrate the most widely adopted shower models used to estimate the primary energy of Ultra High Energy Cosmic Rays. Many of the experimental procedures used to derive the properties of primary UHECRs 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. LHCf experiment successfully took data during 2009 run at 900 GeV and it is now smoothly taking data at 7 TeV collisions. Preliminary results of the ongoing analysis will be presented.

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