

# XXX-th International Workshop on High Energy Physics “Particle and Astroparticle Physics, Gravitation and Cosmology: Predictions, Observations and New Projects”



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## Neutral mesons and photons in pp and Pb-Pb collisions

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Measurements of direct photon and neutral pion production in heavy-ion collisions provide a comprehensive set of observables characterizing properties of the hot QCD medium. Unlike hadrons, direct photons are produced in all stages of a nucleus-nucleus collision and therefore probe the initial state of the collision as well as the space-time evolution of the produced medium. Prompt direct photons provide means to control the initial stage of the collision and ensure that the yield suppression of hard hadrons and in particular neutral pions in Pb-Pb collision is a final-state effect and should be attributed to the parton energy loss in the hot medium. The thermal direct photon spectrum and flow carry information about temperature and space-time evolution of the emitting medium. Measurements of neutral meson spectra in pp collisions at energies  $\sqrt{s}=0.9, 2.76, 7$  TeV serve a reference for heavy-ion collisions, and also provide valuable data for pQCD calculations and for studying scaling properties of hadron production at the LHC energies.

The ALICE experiment at LHC reconstructs photons via complementary methods, using the ALICE electromagnetic calorimeters and the central tracking system identifying photons converted to  $e^+e^-$  pairs in the material of the inner barrel detectors. Neutral pions are reconstructed using their two-photon decays. Since calorimetric and tracking approaches have practically independent systematic uncertainties, their comparison provides a strong cross-check. In this talk, we review recent ALICE results on neutral pion and direct photon production in pp and Pb-Pb collisions.

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