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Direct photon production in p–Pb collisions measured with ALICE/PHOS

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Measurement of the direct-photon spectrum provides a unique tool for testing QCD predictions and for investigating properties of the hot matter created in nucleus—nucleus collisions. Direct photons are produced in all stages of the collision, interact with hot matter only electromagnetically and leave the hot region almost without rescattering. Direct-photon spectrum at high pT imposes constraints on nucleon PDFs and allows to fix the initial state of the collision and the number of nucleon—nucleon collisions. The temperature of the hot fireball created in a heavy-ion collision and development of its collective flow can be studied via measurements of low-pT direct-photon spectrum and collective flow.

The most straightforward method of calculating direct-photon yield is the subtraction method based on subtracting the spectrum of photons originated from decays of final hadrons from the inclusive photon spectrum. Another method is the tagging method, where photons consistent with an assumption of coming from $\pi 0$ decays are removed from the spectrum, with subsequent correction for the corresponding signal loss effects.

In this talk we present results of measurements of the direct-photon spectra in p–Pb collisions at LHC energies obtained with different methods, discuss ways of improving their accuracy and compare experimental results with theoretical predictions.

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