

# THERMAL PHOTONS PRODUCTION IN PROTON-PROTON COLLISIONS AT HIGH ENERGIES

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In proton-proton collision at high energies are produced two type photons: prompt and thermal. Prompt photons are produced at Compton scattering of quark-gluon and at annihilation of quark-antiquark processes [1]. Thermal photons are produced in the processes with participation  $\pi$  mesons [2].

We constructed Feynman diagrams of the thermal photons production in following processes: 1., 2., 3., 4., 5., 6. and wrote matrix elements. Calculation of the square of matrix elements are performed using FeynCalc. The dependence of differential cross section of processes production thermal photons on energy of colliding protons and on cosine of angle of scattering of photons are investigated. In calculation of differential cross section of these processes form factor of mesons also has been taken in account.

It is shown that the differential cross section of investigated processes decreased with increasing of energy of colliding protons. Comparison of differential cross section of processes has been carried out. The dependence of differential cross section of processes 1,3 and 4 on cosine of the angle of scattering photons is symmetric relative to 0 and it increases with the cosine of the angle in the intervals  $[-1, 0]$  and  $[0, 1]$ . The differential cross section of process 2 has a maximum at  $-1$  cosine of the scattering angle of photons and decreases with increasing cosine of the angle scattering photons. The differential cross section of process 5 does not depend on cosine of the angle scattering photons. It is shown that accounting of the form factor of mesons reduces of differential cross section of processes.

1. M. Germain, on behalf of the ALICE Collaboration, Nucl.Phys. A 967, 696 (2017).
2. J. Kapusta, P. Lichard, D. Seibert, Phys.Rev. D 44, 2774 (1991).

## The speaker is a student or young scientist

No

## Section

1. Nuclear structure: theory and experiment

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