

Production cross sections of electron, positrons and gamma rays [15'+10']

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Accurate interpretation of cosmic-ray electron and positron fluxes, as well as gamma-ray emissions, requires precise knowledge of the cross sections governing cosmic-ray interactions with the interstellar medium. Primarily involving protons and helium, these reactions produce secondary positrons and gamma rays, key observables for probing cosmic-ray propagation, dark matter searches, and the study of astrophysical sources such as pulsars and supernova remnants.

In this talk, I will present updated models for the hadronic production cross sections of positrons, electrons, and gamma rays, focusing on pion and kaon production directly obtained from collider data. I will also discuss the challenges posed by cross section uncertainties, identifying which measurements are needed to improve our modeling, and how these cross sections influence the accuracy of theoretical models in comparison with data from space-borne observatories like AMS-02 and ground-based gamma-ray telescopes such as Fermi-LAT.

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Session Classification: Relevant XS reactions and precision for GCRs