

From UPC to semi-central heavy-ion collisions

Monday, 6 March 2023 13:00 (1 hour)

My research aims at solving and broadening the view on current problems related to ultrarelativistic heavy-ion collisions. These results form integral to ongoing and planned experiments at CERN, the European Organization for Nuclear Research.

I will present the elementary and nuclear cross section for electromagnetic production of particles that result from $\gamma\gamma$ -fusion or photoproduction. The research innovation lies in the possibility of making distributions of many measurable kinematic variables, which are often crucial to understanding better the reaction mechanism, rather than being limited to presenting only the value of the total cross section. This aspect of the research can be used to plan future experiments and interpret existing experimental results. My analyses are interdisciplinary. The correctness of the results is strongly influenced by the type of nuclear form factor used, which is known from electron scattering on nuclei. Application of the Fourier transform of the charge density in the nucleus allows a result more consistent with existing experimental data.

I will present results for the electromagnetic production of particles in ultraperipheral heavy ion collisions. I would also like to describe the transition from UPC case to more central collisions and show the verification of theoretical results with experimental ones.

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