

Ultraperipheral collisions with ALICE

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There are several different predictions for the behaviour of the gluon distribution in nuclei at small Bjorken x and experimental data is needed to chose among them. This is achieved by measuring the cross section of processes specially sensitive to this parton distribution. We focus on ultra-peripheral collision of lead-lead nuclei producing a J/ψ meson. Our main task is to calculate the rapidity- and t -dependence of the cross section. In this thesis we report our results with Run-1 data collected with an integrated luminosity of $22.4^{+0.9}_{-1.2} \mu\text{b}^{-1}$. The cross section dependence on rapidity is $d\sigma_{J/\psi}^{\text{coh}}/dy = 0.98^{+0.07}_{-0.06}(\text{sta}) \text{ mb}$. A detailed description of the measurement as well as the first results on low intensity data samples of Run-2 are available in the thesis. Descriptions of our work on UPC triggers and the luminosity calculation framework are parts of the thesis as well.

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