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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 $22.4^{+0.9}_{-1.2}\ \mu\mathrm{b}^{-1}$. The cross section dependence on rapidity is $\mathrm{d}\sigma^{\mathrm{coh}}_{\mathrm{J}/\psi}/\mathrm{d}y = 0.98^{+0.07}_{-0.06}$(sta) 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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