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Coherent photoproduction of J/ψ vector mesons in peripheral and ultra-peripheral Pb-Pb collisions

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The electromagnetic fields of lead nuclei at the LHC are an intense source of quasi-real photons. The coherent photonuclear production of J/ψ provides information about the initial state of nuclei at a perturbative scale related to the mass of the charm quark. Using data from Run 1 at the LHC, the ALICE Collaboration has published cross section measurements of coherent photoproduction of J/ψ in peripheral (with nuclear overlap) and ultra-peripheral (without nuclear overlap) Pb-Pb collisions. Coherent photoproduction is characterized by very low p_T of the produced J/ψ ($p_T \sim 1/R = 30 \text{ MeV}/c$), and in this region of phase space photoproduction dominates over hadroproduction in collisions down to at least 50% centrality. These results will be reviewed here. In addition, new results from Run 2 data for peripheral collisions at mid rapidity, as well as for ultra-peripheral collisions at forward rapidities will be presented.

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