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## Coherent photoproduction of $J/\psi$ 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  $J/\psi$  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  $J/\psi$  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  $J/\psi$  ( $p_T \sim 1/R = 30 \text{ MeV}/c$ ), 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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