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## Charmonium production from small to large systems at LHCb

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Modifications of quarkonia production in hadronic collisions provide an important experimental observable to probe the heavy quark interaction with the nuclear medium. The excited  $\psi(2S)$  state, with a relatively low binding energy, is especially sensitive to these effects. Different phenomena can be probed by studying the excited-to-ground state production ratio in different collision systems with increasing multiplicity. In this contribution, we will present new LHCb results on  $\psi(2S) / J/\psi$  production from pp to PbPb collisions. In addition, progress on new measurements with Run 3 data will be reported.

### Secondary track

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**Session Classification:** T04 (Recent developments heavy ion physics, both experimental and theoretical aspects)

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