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## Measurement of prompt $\psi(2S)$ production cross sections in proton–lead and proton–proton collisions at $s_{NN} = 5.02\text{TeV}$ (Article) [Open Access](#)

Sirunyan, A.M.<sup>a</sup>, Tumasyan, A.<sup>a</sup>, Adam, W.<sup>b</sup>, Ambrogio, F.<sup>b</sup>, Asilar, E.<sup>b</sup>, Bergauer, T.<sup>b</sup>, Brandstetter, J.<sup>b</sup>, Brondolin, E.<sup>b</sup>, Dragicevic, M.<sup>b</sup>, Erö, J.<sup>b</sup>, Escalante Del Valle, A.<sup>b</sup>, Flechl, M.<sup>b</sup>, Friedl, M.<sup>b</sup>, Ghete, V.M.<sup>b</sup>, Hrubec, J.<sup>b</sup>, Jeitler, M.<sup>b</sup>, Krammer, N.<sup>b</sup>, Krätschmer, I.<sup>b</sup>, Liko, D.<sup>b</sup>, Madlener, T.<sup>b</sup>, Mikulec, I.<sup>b</sup>, Rad, N.<sup>b</sup>,

[View additional authors](#) [v](#)

<sup>a</sup>Yerevan Physics Institute, Yerevan, Armenia

<sup>b</sup>Institut für Hochenergiephysik, Wien, Austria

<sup>c</sup>Institute for Nuclear Problems, Minsk, Belarus

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### Abstract

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Measurements of prompt  $\psi(2S)$  meson production cross sections in proton–lead (pPb) and proton–proton (pp) collisions at a nucleon–nucleon center-of-mass energy of  $s_{NN} = 5.02\text{TeV}$  are reported. The results are based on pPb and pp data collected by the CMS experiment at the LHC, corresponding to integrated luminosities of  $34.6\text{nb}^{-1}$  and  $28.0\text{pb}^{-1}$ , respectively. The nuclear modification factor  $R_{pPb}$  is measured for prompt  $\psi(2S)$  in the transverse momentum range  $4 < p_T < 30\text{GeV}/c$  and the center-of-mass rapidity range  $-2.4 < y_{CM} < 1.93$ . The results on  $\psi(2S) R_{pPb}$  are compared to the corresponding modification factor for prompt  $J/\psi$  mesons. The results point to different nuclear effects at play in the production of the excited charmonium state compared to the ground state, in the region of backward rapidity and for  $p_T < 10\text{GeV}/c$ . © 2019 The Author

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### Author keywords

[CMS](#) [pPb](#)  [\$\psi\(2S\)\$](#)

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