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Physics Letters, Section B: Nuclear, Elementary Particle and High-Energy Physics Open Access
Volume 790, 10 March 2019, Pages 270-293

Measurement of nuclear modification factors of Υ(1S), Υ(2S), and Υ(3S) mesons in PbPb collisions at s_{NN} =5.02 TeV (Article) (Open Access)

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Abstract

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The cross sections for Υ(1S), Υ(2S), and Υ(3S) production in lead–lead (PbPb) and proton–proton (pp) collisions at s_{NN} =5.02 TeV have been measured using the CMS detector at the LHC. The nuclear modification factors, R_{AA}, derived from the PbPb-to-pp ratio of yields for each state, are studied as functions of meson rapidity and transverse momentum, as well as PbPb collision centrality. The yields of all three states are found to be significantly suppressed, and compatible with a sequential ordering of the suppression, $R_{AA}(\Upsilon(1S)) > R_{AA}(\Upsilon(2S)) > R_{AA}(\Upsilon(3S))$. The suppression of Υ(1S) is larger than that seen at s_{NN} =2.76TeV, although the two are compatible within uncertainties. The upper limit on the R_{AA} of Υ(3S) integrated over p_T, rapidity and centrality is 0.096 at 95% confidence level, which is the strongest suppression observed for a quarkonium state in heavy ion collisions to date. © 2019 The Author(s)

SciVal Topic Prominence

Topic: collisions | production | nuclear modification

Prominence percentile: 91.688

Author keywords

Bottomonium CMS Heavy ion collisions Physics Quark gluon plasma Quarkonium suppression

Funding details

Funding sponsor	Funding number	Acronym
California Earthquake Authority		
European Regional Development Fund		
Ministry of Education and Science		

Funding sponsor	Funding number	Acronym
Universidade de Macau		
Rochester Academy of Science		
State Atomic Energy Corporation ROSATOM		
Agentschap voor Innovatie door Wetenschap en Technologie		
Chulalongkorn University		
Ministerstvo Školství, Mládeže a Tělovýchovy		
European Regional Development Fund		
	2012/07/E/ST2/01406,2014/13/B/ST2/02543,2014/14/M/ST2/00428,2014/15/B/ST2/03998,2015/19/B/ST2/02861	
General Secretariat for Research and Technology	Hungary	

Funding text

The authors would like to take this opportunity to acknowledge the invaluable contributions of Roy J. Glauber to the field of heavy ion nuclear physics. Without his work, our understanding of the modifications of particle production in heavy ion collisions, of which this paper is only one of very many, would not have been possible. We congratulate our colleagues in the CERN accelerator departments for the excellent performance of the LHC and thank the technical and administrative staffs at CERN and at other CMS institutes for their contributions to the success of the CMS effort. In addition, we gratefully acknowledge the computing centres and personnel of the Worldwide LHC Computing Grid for delivering so effectively the computing infrastructure essential to our analyses. Finally, we acknowledge the enduring support for the construction and operation of the LHC and the CMS detector provided by the following funding agencies: BMWFW and FWF (Austria); FNRS and FWO (Belgium); CNPq , CAPES... View all

ISSN: 03702693
CODEN: PYLBA
Source Type: Journal
Original language: English

DOI: 10.1016/j.physletb.2019.01.006
Document Type: Article
Publisher: Elsevier B.V.

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