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Applications of JIMWLK Evolution to Exclusive J/ψ Production in the ATLAS Detector

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Abstract content
 (Max 300 words)

The current framework for our fundamental understanding of matter and interactions is the Standard Model of particle physics. Hand-in-hand, theoretical and experimental physicists have built this theory using cutting-edge mathematical tools and innovative experimental techniques. One such experimental endeavor is the Large Hadron Collider (LHC) located at the European Centre for Nuclear Research (CERN) in Geneva, Switzerland. The ATLAS experiment uses the proton and heavy ion collisions produced in this 27 km long particle collider to probe the predictions and limitations of the Standard Model. Due to the high energies employed at the LHC, collisions are able to probe a regime known as the Colour Glass Condensate (CGC): a medium characterized by a part of the hadronic wavefunctions being dominated by nonperturbatively large gluon occupation numbers. The JIMWLK equation is a mathematical tool used to predict some of the physical observables within the CGC framework. By exploiting appropriate exclusive interactions (where at least one of the protons does not break), this work attempts to calculate the exclusive J/ψ production cross-section using a truncation of the JIMWLK equation and to measure this cross-section in the ATLAS experiment.

Apply to be
 considered for a student
 award (Yes / No)?

Yes

Level for award
 (Hons, MSc,
 PhD)?

MSc

Main supervisor (name and email)
and his / her institution

A/Prof. Heribert Weigert / University of Cape Town

Would you like to
 submit a short paper
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 Proceedings (Yes / No)?

Yes

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