

Posudek školitele na diplomovou práci

Student: David Grund

Title: Incoherent photoproduction of J/ψ in ultra-peripheral Pb-Pb collisions with ALICE

Supervisor: Guillermo Contreras

Grade: A (výborně)

This work presents experimental results obtained in the framework of the ALICE Collaboration of a special class of events, which allow us to study quantum fluctuations of the gluon structure of Pb nuclei. The analysis presented in this thesis will be the basis of an ALICE paper that we expect to submit to the Collaboration for approval towards the end of September.

The work is structured in 6 chapters, an introduction and the conclusion as well as one appendix. The Introduction sets the scene and briefly describes the structure of the work. Chapter 1 introduced the main physics phenomena to be studied with the measurement presented in the thesis, while Chapter 2 introduces ultra-peripheral collisions that provide the event sample to perform the measurement. Chapter 3 is devoted to an overview of recent theoretical papers attempting to describe the measurement that is presented later on. Chapter 4 describes the main components of ALICE needed for the analysis. Chapter 5 reviews recent experimental results in the area. The main original contribution of the thesis is discussed in Chapter 6 that describes the analysis of data and the measurement performed with them. The conclusion part summarises the work.

The measurement involved data from the 2018 Pb-Pb data taking period. David developed himself all the analysis code, reproduced the main steps of the existing results from a related, and recently published, measurement to cross check the machinery. He then proceeded to perform a brand-new analysis, from which he obtained a preliminary cross section. In order to request ALICE to write a paper with these results only a few studies related to systematic uncertainties are needed. David has already presented the results of his analysis in the corresponding ALICE meeting, where the results were received very positively.

In summary, David Grund has performed on his own a complete analysis for a new measurement which will be prepared for publication in the next few months. This is quite an achievement for a Diploma student. For this reason, the note I assign to this Diploma Thesis is **A (výborně)**.

Guillermo Contreras,
Prague, May 20, 2021.