

## Posudek školitele na diplomovou práci

**Student:** Vendulka Fílová

**Title:** Coherent  $J/\psi$  photoproduction in Pb-Pb collisions with forward neutrons with LHC Run 2 data

**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 that allow us to study the energy evolution of the QCD structure of a Pb nucleus.

The main result of the analysis presented in this thesis is the development of a procedure to determine a correction factor for a new type of inefficiency that became important for the energies at the LHC and the conditions of the ALICE detector. This correction is large in some parts of the phase space, almost 20% for one of the cross sections we want to measure and will be applied in the corresponding measurement to be published in the next few months.

The work is structured in 8 chapters. The introduction sets the stage and describes briefly the structure of the work. Chapter 2 provides a concise summary of the main physics ideas explored in this work. Chapter 3 describes the main components of ALICE needed for the analysis. Chapter 4 and 5 are devoted to an overview of recent theoretical and experimental papers related to the analysis of data that is presented in Chapter 6. The main original contribution of the thesis is discussed in Chapter 7 that describes the correction to take into account events accompanied by electromagnetic dissociation of one or both of the nuclei and which produce charged particles at very forward rapidities. Chapter 8 summarises the work.

The procedure developed by Vendulka was not trivial, because in ALICE we did not have control triggers to compute in a direct way the inefficiency. She had to use different triggers to account for different effects and put together the corresponding framework. As the physical process is very sensitive to background, pile-up and the detector efficiency, attaining a good correction was quite complicated, but Vendulka manage to do it. As it turned out that the correction factor is large, the work performed by the student became very important.

In summary, Vendulka Fílová not only completed the requested work for his Diploma Thesis, but also found a correction factor that will be important for a publication being prepared now by ALICE. This is quite an achievement for a Diploma student. For these reasons the note I assign to this Diploma Thesis is **A (výborně)**.

Guillermo Contreras,  
Prague, May 20, 2021