Referee report on the PhD dissertation by Mgr. Víta Kučery

Study of strange particle production in jets with the ALICE experiment at the LHC

The work is devoted to the very topical task to gain maximum information about collisions of protons and nuclei from the experimental data measured by LHC experiments. More specifically the analysis focused on the production of Λ a K^0_S within jets measured by ALICE experiment is presented. I consider the methods used in the dissertation to be fully adequate, I think that the work meets its aim and brings new scientific results, discussed and defended within the ALICE collaboration, presented on well established conferences in the field (Hot Quarks 2014, Hard Probes 2015) and published in their conference proceedings.

This is the main message of my report; I will add only some more remarks. I read the dissertation with interest and pleasure. It contains very reasonable introductory chapters 1 and 2, report about the author's service task for ALICE experiment which is not directly relevant to the topic, then very detailed 4. chapter describing the analysis itself and summary chapter 5.

The English is easy to read and understand with minimum of misprints, in standard Latex form. I am only not so happy about the arrangement of figures, when Latex has been stronger then the author: e.g. the comments to Fig. 5.7 at the middle of page 94 refer to page 98 after that a rather important paragraph (*The main message…*) at the bottom of page 97 (subchapter 5.2) continues with just one line only on page 101.

I notice some features of the introductory chapters which seems strange to me: The reference *A Glauber model [12] …* on page 10 refers to a current very useful review but I miss any comment on original source (and long history of the Glauber model). Similarly, when introducing the notion of the jet at the paragraph 1.3.1, page 11, author refers to ALICE Physics Performance Report, vol. II. My ironical note is that jets are in particle physics a little bit longer and studied also by other experiments. Some sentences sound quite categorically, although I will expect them rather as a reasonable expectation *(Partons with $p_T \leq 10$ GeV/c are not able to reach the opposite edge of the medium volume…)*.

None of these remarks spoils my opinion that the work fulfils without any doubt the requirements for PhD dissertation and shows clearly the author's is capability of independent scientific work. So I think the author should get the title PhD after the successful defence.

Prague 27. 10. 2016

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Questions:

- I will appreciate a more detailed explanation of the estimate of errors when background is subtracted from the raw data (p. 56 bottom)
- What are the arguments for the choice of (rather small) lower bound for the jet area in 4.4.3?
- Please comment on the difference of jet spectra for R=0,2 a 0,3 (Figs. 4.4, 4.5 ...)
- Please some more comments on non-necessity of the BBB correction or better unfolding (p. 74)
- Some simple model illustrating the performance of weighting introduced on page 79?
- Is it possible to say something more on Λ/antiΛ discrepancy (or about the TPC calibration problem)?