

Review of the dissertation of Mgr. Pablo Rodríguez-Ramos

Experimental results in pion induced reaction with carbon and polyethylene targets obtained by HADES-GSI

The dissertation is devoted to the experimental study of one specific reaction measured at HADES experiment at GSI Darmstadt, $\pi p \rightarrow n e^+ e^-$, and reports also about a lot of a “service” work for the experiment including the preparation of the electromagnetic calorimeter. His (according to the message of HADES representatives he played a crucial role) analysis contributes to the general aim to measure the detailed properties of vector mesons, baryon resonances, concepts like the Vector Meson Dominance and all that. Specific pion momentum used in this study enables to choose the specific resonance region, the focus on e^+e^- pairs enables to fully exploit the HADES detector. I consider the study as interesting and topical. The methods used are appropriate and embedded in the wide international collaboration of the experiment. The results are valuable, but of course, they represent just a piece of the new knowledge acquired by HADES. This is also illustrated by the fact, that they were presented at FAIRNESS 2016 conference and not yet (after 7 years!) in some summary HADES paper. These opinions provide answers to the “standard review questions”.

In have some more comments on the dissertation that is far from being ideal in my opinion. There are many misprints, many strange formulations, many signals that repeating standard wisdom in a specific scientific branch may not stand for deep understanding enabling also simple and clean explanations. I will illustrate it by just few examples:

- misprints: *throw* (14x) or *trough* (4x) instead of through, *quarks with* (instead of without) *excited states* (p. 7), expression for α (p. 9), masses of c, b, t quarks in MeV instead of GeV (p. 10), *space-liked*, *time-liked* (6x), *effectuate* (? , p. 54), ...
- strange formulations: *particles that define the Standard Model* (p. 7), *we can categorized* (p. 17), (7.5) – the square of the four-momentum with metric tensor, just square everywhere else???, ...
- strange organization of the dissertation: Why the section 1.6 is not a part of Introduction?
- TeX subtleties: indentation of the line after the formula (almost everywhere), single line on the page (p. 147), ...

I am quite surprised that most probably nobody else than author have read the submitted text; what about the supervisor?

I am looking forward to the presentation during the defence meeting. Maybe I will suggest a few proposals for brief comments of the author:

- a simple guide to look at Fig. 1.10 and the difference between time- and space-like process,
- how Hough transform works,
- where are Cherenkov photons (typically 110 from an electron with 0.1 GeV) lost? (p. 42),
- does the estimate of the pion beam pollution (p. 48) works after passing the beam line to HADES?
- a clear overview of author’s contribution versus overview of other’s work.

To summarize: In my view the dissertation fulfils the usual requirements, but not excels. It illustrates that the author is capable of a valuable scientific activity and could be awarded the degree of PhD.

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