THE REVIEW COMMENTS ON THE MANUSCRIPT "TAGGED DEEP INELASTIC SCATTERING MEASUREMENT ON DEUTERIUM WITH THE LAD EXPERIMENT" SUBMITTED FOR PUBLICATION IN EPJ

The manuscript describes an experiment at Jefferson Lab aimed at studying the modification of the neutron structure function in the nuclear medium. The article is not an original work. It updates the planned experiment with detector configuration changes, a new simulation, and expected results. The experiment will study the structure-function modification in the double ratio of relative changes of experimental and Monte-Carlo generated yields. For this, some assumptions are made that need explanations. The main concern is addressing these assumptions and accounting for their uncertainties. Considering the marginal rejection power of expected results for the existing model predictions, systematic uncertainties will have a qualitative impact on the conclusion. The other comments are related to the clarity of the detector and the experiment presentations. Detailed comments are below:

- 1. Abstract: "LAD experiment at the Thomas Jefferson National Laboratory (JLab)".
- 2. Page 1, right column, 1st line: EMC means European Muon Collaboration, therefore, saying "the EMC ... observed, ..." is incorrect. It should be "While the EMC effect and other modifications have been observed, there ...".
- 3. Page 1, right column, 1st line: will need a reference for "other modifications".
- 4. Page 2, left column, the phrase "the older PRAD" is not a proper way to address the experiment; "the first PRAD" is better.
- 5. The definition of P_T is not in the appendix.
- 6. Page 2, right column, equation: why are there two numbers (1) and (2)? The (1) never gets referenced, and this is one equation anyway.
- 7. The equality of the double ratio of yields and the double ratio of cross sections is not exact. Some systematics cancel out in the double ratio, but not all. There are two big factors that will affect this equality when integrating over variables, in this case, Q^2 and P_T , and have finite width bins for others that the ratio depends on (α_S, x') . The yield $Y(x) = a(x)\sigma(x)$, where the efficiency $a = f(d, \sigma)$. The physics (σ) and the detector (d) models will never be precise representations of reality. Therefore, the equality of (1) and (2) will have uncertainties. Given the marginal impact of the experiment to refute the models within expected statistical uncertainty, the article will benefit significantly from the discussions of systematic uncertainties from various sources and the evaluation of the impact on the results.
- 8. FSI, the statements "less sensitive" and "should be suppressed" must be backed with an estimate of systematic uncertainties arising from ignoring FSI for Eq.(3).
- 9. Page 3, Fig.2 caption: the phrase "LAD detector at $\approx 150^{o}$ " is incorrect, "the LAD detector covering up to 150^{o} " will work. Why 150 and not 157, as it says in the text?
- 10. Page 4, left column, 1st line: "abstraction right next to" needs explanation as it limits the backward angle coverage of LAD to 157 degrees. From Fig.2, it looks like LAD can be moved to the right, towards larger angles somewhat more. Which of the obstructions limits the move?

- 11. Page 4, right column, the last paragraph: LAD layout in the renderings in Figs. 1 and 2 shows double layers for the back-most two planes. The text only talks about five planes. What are these five planes? The description should explain that two planes have a double layers of scintillator counters and why.
- 12. Page 4, right column: What are the MPD and VTP interfaces? Need a definition for the reader to understand.
- 13. Page 4, right column, the last line, should be "updated".
- 14. Page 5, the caption of Fig.4, should be "... used in the first PRAD experiment.".
- 15. Table 1 shows the settings of spectrometers. It will be much more informative and beneficial for the reader to present ranges of Q² and x' for each setting.
- 16. Page 5, right column, reference to Fig.5 and the caption of Fig.5: In the figure, model predictions are for the double ratio of F_2^n structure functions. The observable for the LAD experiment is the double ratio of yields. There are assumptions made to go from Eq. (1)-(2) to (3). Evaluating the systematic uncertainties due to these assumptions, including ignoring FSI and the above comment #7, is crucial to understanding the impact of these measurements.
- 17. The conclusion, "to make a significant statement," is too strong even if considering only statistical errors shown in Fig.5. The phrase "has potential to refute some of the models" or similar is perhaps more appropriate. The same comment goes for the Summary.