REVIEWER 2:

Dear Reviewer 2,

Thank you for your time invested in reading and inspection of the manuscript. I would like to comment on your suggestion for minor changes of the manuscript in your text below:

This manuscript describes the outcome of a design study for a multiwire PSD neutron detector based on B4C thin film substrates.

1)... A drawback of the switch to solid-state converter is the accompanied strongly limited (to micrometres) ion escape length from the conversion point. ...

Comment: Include some comment on the resulting wire distance/resolution: This necessitates to have the wires at a distance of ..., resulting in resolutions of ...

I know there is no simple 1 to 1 relation, and there are other restraints, but to give the reader an impression of reasonable dimensions, since a few micrometers wire distance are certainly unfeasible.=> This topic has been now discussed in more details in the revised version of the manuscript in chapter 2.1 and additional explanations at the particular place in the text had been added.

2)... But, due the good controllable deposition properties of 10B4C coatings on the lightweight material Al [1, 20-22], the development of PSND in the last decade shifted towards ...

Comment: In this font l and 1 look alike. Perhaps write aluminium instead of Al, not to confuse the reader and looking for some unknown alloy.=> done :-D

3)The size of the active area of a PSND at a constant sample-detector distance defines the in one detector configuration accessible range of wave-vector transfer covered in a scattering/diffraction experiment for a chosen pulse and wavelength band

Comment: Word order: The size of the active area of a PSND at a constant sample-detector distance defines the accessible range of wave-vector transfers covered in one detector configuration for a given scattering/diffraction experiment at a chosen pulse and wavelength band.=> thank you for your help. Done

4)... Δd/d down to 0.1%...

Comment: Please quote resulting delta lambda/lambda, delta Q / Q or other. This looks like it is only the positioning accuracy of the sample with respect to the detector, which may be a bit arbitrary.

The following explanation/calculation elaborates a bit on that, but some explicit number would be nice. Something like: Assuming XXX and YYY This results in a resolution of ...

=> Indeed the sample to detector distance plays a role to (to accommodate typical size engineering in-situ sample environment).

5)... Since the ion stopping-power in solids is very high compared to the one in gas, an efficient 10B4C conversion coating thickness has to be elaborated. Following the argumentation of [1,6,14,37], the appropriate 10B4C converter thickness has been fixed to 1.2 µm 10B4C. ...

=>Since the ion-stopping-power in solids is very high and therefore the ion-range with a few micrometres short, compared to the one in gas (millimetres), an efficient $^{10}B_4C$ conversion coating thickness has to be elaborated. To allow to the ions from branch (A) and (B) above to escape from the conversion coating with enough kinetic energy in to the detection gas and to ionise it, the converter thickness has to be chosen below the shortest ion-range. Following the argumentation of [1,6,14,44], the appropriate $^{10}B_4C$ converter thickness has been fixed to 1.2 µm $^{10}B_4C$. This $^{10}B_4C$ converter coating thickness is a reasonable trade-off between neutron capture probability in the converter coating and a high enough ion escape efficiency out of the converter combined with a high enough kinetic energy of the ions emitted from a single $^{10}B_4C$ layer to ionize of the adjacent stopping/detection gas.

Comment: Here a short explanation of the arguments would be nice. Respectively, please clarify that the following considerations (trade-off stopping power and charged particle escape, window size and stability etc.) are those arguments.

6)...To counteract the approach of the detection wires to the converter surface, a patented compensation volume design, had been developed by the Hereon research centre [4]. ...

Comment: I think I understand the concept, but a sketch would have been nice.=> Done.

7)Figure 3c

Comment: y-axis should be called integrated intensity to mark difference between the plots.=> Right. We called it now “integrated efficiency”, since it is the efficiency integrated over the modules. Now it is the Figure 6(C).

Conclusions:

Comment: It would be nice to get a few sentences on the potential instruments where such a detector could be used.=> done.

BEER is mentioned, however from the design I imagine that evacuated detector volumes would not be ideal. Are there other restrictions? => The detector is not evacuated during the

operation. The stopping-gas pressure in the vessel is almost at the same level as the ambient pressure. The operation of the detector-gas is planned as closed-cycled.

The detector will be evacuation only in the phase after maintenance or during gas exchange. To prevent the big housing for implosion during the evacuation, there is a big stable and gas tight hood (maintenance tool) with heating, which isolates the detector housing from ambient pressure during evacuation. The presence of this hood was not mention in the manuscript because the authors wanted to avoid an additional discussion of a huge structural part, which is basically a tool and not really an attractive part of the detector development. But it can be mentioned shortly in the text, that such a hood is in place, when the reviewer 2 wish this.

What are the most decisive differences/advantages to other technologies?=> The authors add in chapter 1.1 and Conclusions a short and general statement on the advantages/cost of the MWPC-technique in neutron detection. A more concrete statement should be made after a successful realization and tests of the detector. We ask for understanding of the reviewer 2 for a conservative approach of the authors to “high flying claims/promises”. ;-D