

Dear Editors,

Please find attached the new revised manuscript *Conceptual design of supermirror polarizers at the European Spallation Source* following the comments of the reviewers.

We would like to thank to the reviewers for their comments. We found them very constructive and we are sure they will contribute to improve the quality of the manuscript.

There have been substantial changes in the manuscript following the comments from the reviewers.

Section 2 has been extended and renamed as “Technical considerations, simulation method and design principles”. In this revised section, many of the comments made by the reviewers are addressed. They are listed below:

- Fig. 1 has been modified excluding the beam direction.
- Discussion on the technical choice of supermirror cavities in comparison with ^3He cells
- Discussions on transport of neutrons in the wrong spin state and full reflection of the beam at long wavelengths.
- Discussion on depolarization effects and applied magnetic field.
- Details on the McStas simulation and the modified modules used in the simulations.
- Discussion on the effect of the order of the layers in the blades
- Discussion on the Si absorption of the blades together with the definition of transmission in the study. It also includes fig. 2
- Discussion on the effect of the separators in the multichannel cavities
- Discussion on the guide system design at ESS, which differs from other facilities due to different moderator geometries, and its effect in the designing principles.

Sections 3 and 4 in the old manuscript have been merged and changed.

- Sketches on the location of the polarizers in the studied instruments have been added (figs. 4, 8 and 12 in the revised manuscript) together with a more detailed explanation of them.
- All discussions about optimal parameters are made inside the section.
- Figures on the transmission of the polarizers (figs. 7, 11 and 18 in the revised manuscript) have been corrected to include the estimation of Si substrate absorption, which makes the choice of optimal parameters easier to select in the figures.
- All the color map figures (figs. 5, 9, 13, 14, 15, 17 in the revised manuscript) include the color scale.
- All figures regarding the wavelength dependence of P^2T (figs. 15, 16 and 17 in the old manuscript) have been taken away in order to clarify the message that the transmission (and additionally in the case of ODIN, beam spatial homogeneity) is the main driver to choose the optimal parameters.
- Fig. 10 in the old manuscript (acceptance diagrams of the beam in ODIN at the end of the guide system) has been substituted by fig. 14 in the revised manuscript (acceptance diagrams of the beam in ODIN at the detector position). This figure makes it easier to understand the chosen design principle for ODIN.

Conclusions in section 4 in the revised manuscript has been modified accordingly and they do not lead to a conclusive design for ODIN, but gives valuable insight for future design work.

We also have included references 16, 18-26 in the revised manuscript.

We really hope that all these modifications have addressed the reviewers' comments in a satisfactory way.