

Interactive comment on “Parametric slat design study for thick base airfoils at high Reynolds numbers” by Julia Steiner et al.

Anonymous Referee #2

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The paper deals with the slat design for thick base profiles at high Reynolds numbers. Due to various combinations of presented cases it is hard to follow the intended logic in the structure. There are too many different cases which are compared back and forth with references to the appendices. The authors should try to better structure the cases and results. After reading the paper I have a hard time to really summarise it for me with a take home message.

Here are a few points that should be addressed.

Page 5. In the shape parametrisation it is written that the leading edge location was fixed to the coordinate system (0,0). Since slat and base profile combined are subject to optimisation it is not clear which leading edge is fixed to (0,0)

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Page 6: The optimisation objectives are formulated as a weighted sum of the performance under clean and rough conditions. What do the authors mean by rough conditions and how do they define it?

Page 6: In eq. 5 and 6 the weighting terms have the index "clean / tripped". So far it is not clear what that means. The authors should give more details on the tripping they applied in their simulations. Also, is only the main profile tripped or also the slat?

Page 8/9: The authors try to validate their fluid models against different benchmark cases. In the first one they use MSES and CFD and in the second one they use only CFD. They argue that they can use the lower fidelity model for their optimisation procedure – this is only based on the first benchmark. On the contrary, the authors say that the simple model has problems to converge due to the sharp edges in the geometry. This is a limiting factor in their procedure. So why do the authors also show the second benchmark that does not contribute to their decision?

Page 10: In figure 6 the results for clean and rough are plotted. Again, it is not clear what "rough" refers to and how it is defined.

Page 11: The caption of figure is insufficient, what are e.g. the different lines (dotted, dashed and solid) of the slat?

Page 12: Figure 8: What is L_{max} , I_{interm} and G_{max} ? What is the "integral design"?

Page 13: Third bullet point: Where is the influence of the base profile thickness discussed?

Page 13: Figure 9: Again, in the caption is stated "rough" and "tripped" without any further description.

Page 14: Second sentence: What do the authors refer to by stating " Hence, the profiles optimized for maximum lift actually perform worse in terms of maximum lift as compared to the ones optimized for maximum glide ratio" ? Where can this be seen in figure 9? Which is the design for lift optimisation and which is the one for maximum

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glide ratio?

Page 15: Figure 11: insufficient caption.

Page 17. figure 13: What are the differences on the plots? Even the text doesn't help.

Typos:

page 4, line 94: The second sentence should start with "They" instead of The

page 4, line104: The second sentence at the end of this line should be "Manso Jaume"
" " there should be no "and" since it is a double name of the author.

Interactive comment on Wind Energ. Sci. Discuss., <https://doi.org/10.5194/wes-2019-66>, 2019.

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