

Wind Energ. Sci. Discuss., referee comment RC2
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Comment on wes-2021-110

Anonymous Referee #2

Referee comment on "Surrogate models for the blade element momentum aerodynamic model using non-intrusive polynomial chaos expansions" by Rad Haghi and Curran Crawford, Wind Energ. Sci. Discuss., <https://doi.org/10.5194/wes-2021-110-RC2>, 2021

This paper presents surrogate models for the calculation of aerodynamic loads on wind turbine rotors using non-intrusive Polynomial Chaos Expansions. The proposed models have applied to the NREL 5MW rotor.

The specific comments are as follows.

Abstract

The key findings of this work should be highlighted at the end of the abstract.

1. Introduction

It would be appropriate to add one or two paragraphs to review relevant students on this topic. For example, review relevant studies on developing surrogate models for the calculation of aerodynamic loads on wind turbine rotors.

The research gap addressed by this paper should be highlighted.

The novelty/contributions of the paper should be highlighted.

2. Methodology

It would be appropriate to add a flowchart to illustrate the methodology used in this paper.

The accuracy of aerodynamic load calculation is highly dependent on the aerodynamic model. The aerodynamic model used in this study should be elaborated.

It would be appropriate to highlight what the novelty of the methodology proposed by this paper is.

3. Results

The aerodynamic model plays a crucial role in the calculation of the aerodynamic loads. Therefore, it would be appropriate to perform case studies to validate the simplified aerodynamic model used in this study. For example, perform a case study to compare the aerodynamic torque and thrust obtained from the simplified aerodynamic model against the results obtained from NREL FAST code.

For the surrogate model, it would be appropriate to list all the independent variables (i.e. input variables) and dependent variables (i.e. output variables).

More case studies should be performed to validate the surrogate model. For example, the results obtained from the surrogate model should be compared against the results obtained from the direct simulation using aerodynamic model. The R squared value should be presented.