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Interactive comment on "A Validation and Code-to-Code Verification of FAST for a Megawatt-ScaleWind Turbine with Aeroelastically Tailored Blades" *by* Srinivas Guntur et al.

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Dear Reviewer 1,

Thank you for your time and valuable comments on our manuscript. Here are our responses to your comments.

Comment: "... my recommendation is either to provide details for Siemens tool which are beneficial for the reader in order to understand the results, or remove the data from the graphs."

Response: We will add the following information that gives more details on BHawC,

along with the relevant citation that contains more details about BHawC:

Description of BHawC:

BHawC is an aeroelastic simulation tool used to study the dynamic response of wind turbines. The model consists of substructures for foundation, tower, nacelle, drivetrain, gearbox, hub, and blades. The structure is modelled primarily with finite beam elements and the aerodynamics is modelled using blade element momentum theory. The code is coupled to a controller identical to that on the real turbine.

The structural model of BHawC employs a co-rotational beam formulation, which is a combined multibody and linear finite-element representation allowing for geometric nonlinearities through a series of multiple bodies, each composed of a linear finite element. The BHawC model of the SWT-2.3-108 blade used in the current study was initially curved in space and discretized into 16 linear elements. In other parts of the turbine where bearings are present, special elements are introduced and the drivetrain consists purely of torsional elements. The aerodynamic force in BHawC is calculated at a given number of points on the blades, in this case 63, positioned independently of the structural nodes. Blade element momentum theory is applied to determine the tangential and axial induced velocities at these aerodynamic calculation points, and Prandtl's tip loss correction as well as a correction for thrust at high induction values are implemented. The blade-element implementation in BHawC also allows for unsteady and skewed inflow. The aerodynamic force is based on 3D-corrected coefficients for stationary airfoil data, and a Beddoes-Leishman type model for unsteady/dynamic events. In addition, BHawC contains a model for tower shadow, and it also calculates the aerodynamic forces on the nacelle and tower. For further details on BHawC , see [1].

[1] Skjoldan, Peter Fisker. "Aeroelastic modal dynamics of wind turbines including anisotropic effects." PhD Thesis, Risø-PhD-66(EN), March 2011. http://orbit.dtu.dk/fedora/objects/orbit:85866/datastreams/file_5509069/content

Sincerely, Srinivas Guntur.

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