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Interactive
comment

Interactive comment on "Detection of ice mass based on the natural frequencies of wind turbine blade" *by* S. Gantasala et al.

Anonymous Referee #1

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I recommend that the manuscript is rejected mainly for two reasons:

1) The method proposed by the authors rely on the estimation of five modal frequencies of each blade during operation. The authors do not discuss how these frequencies are estimate, or what accuracy of such estimation is needed for their method to work. The flapwise blade modes are highly damped by the aerodynamic forces and they cannot be estimate from methods like stochastic subspace identification methods. Edgewise blade modes are low damped, but here the problem is identify the modal frequencies for the individual blade. For a three-bladed turbine, the blade vibrations are coupled in symmetric and forward and backward whirling modes.

2) The authors seem to have decided to use neural network to transform five inputs to three outputs describing the distribution of the ice masses, which is not justified.

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Discussion paper

Why not use a simple least square method, or even simpler a linear transformation from three blade frequencies like the first three edgewise blade frequencies to the ice masses in the three spanwise positions on the blade.

Besides these fundamental issues with the manuscript I have attached my detailed comments to the manuscript in the pdf file.

Please also note the supplement to this comment:
http://www.wind-energ-sci-discuss.net/wes-2016-30/wes-2016-30-RC1-supplement.pdf

Interactive comment on Wind Energ. Sci. Discuss., doi:10.5194/wes-2016-30, 2016.