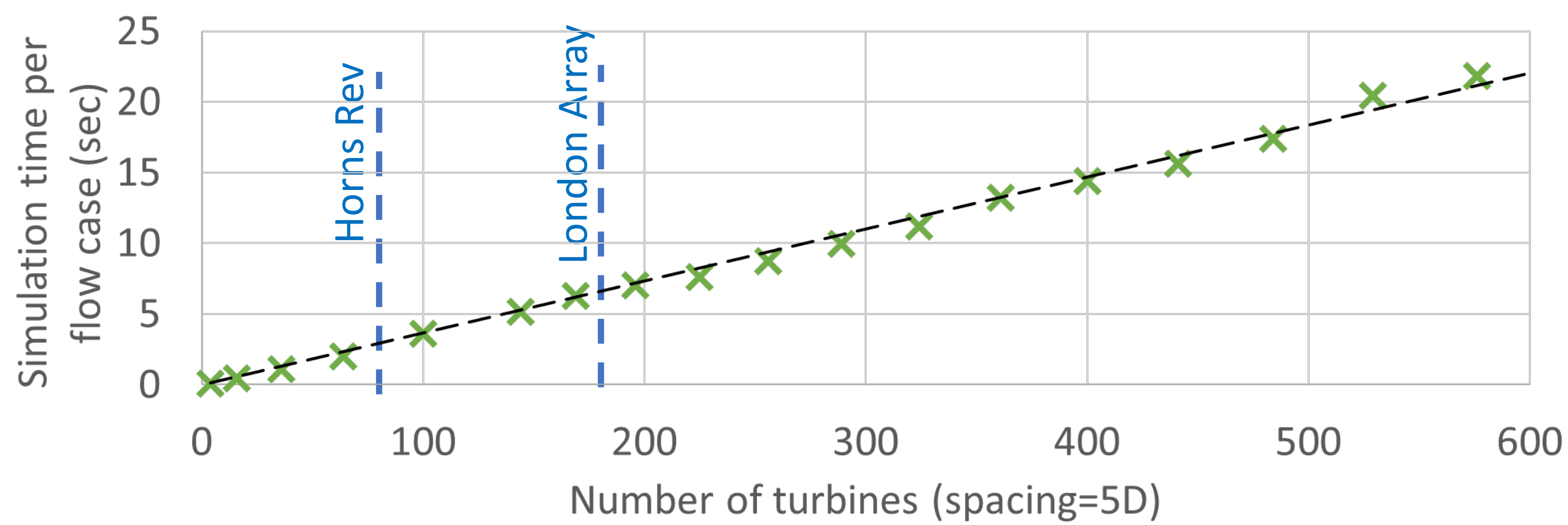


Introduction

In wind farm energy assessments, low fidelity single wake models such as the Jensen and Ainslie models have been used to calculate wake losses due to the performance requirements of calculating a very large number of wind farm flow cases. However, due to the increase in computer performance and advent of cloud computing, it is now possible to use higher fidelity models and reduce wake uncertainty. WakeBlaster is a cloud-based 3D RANS multiple wake simulator.

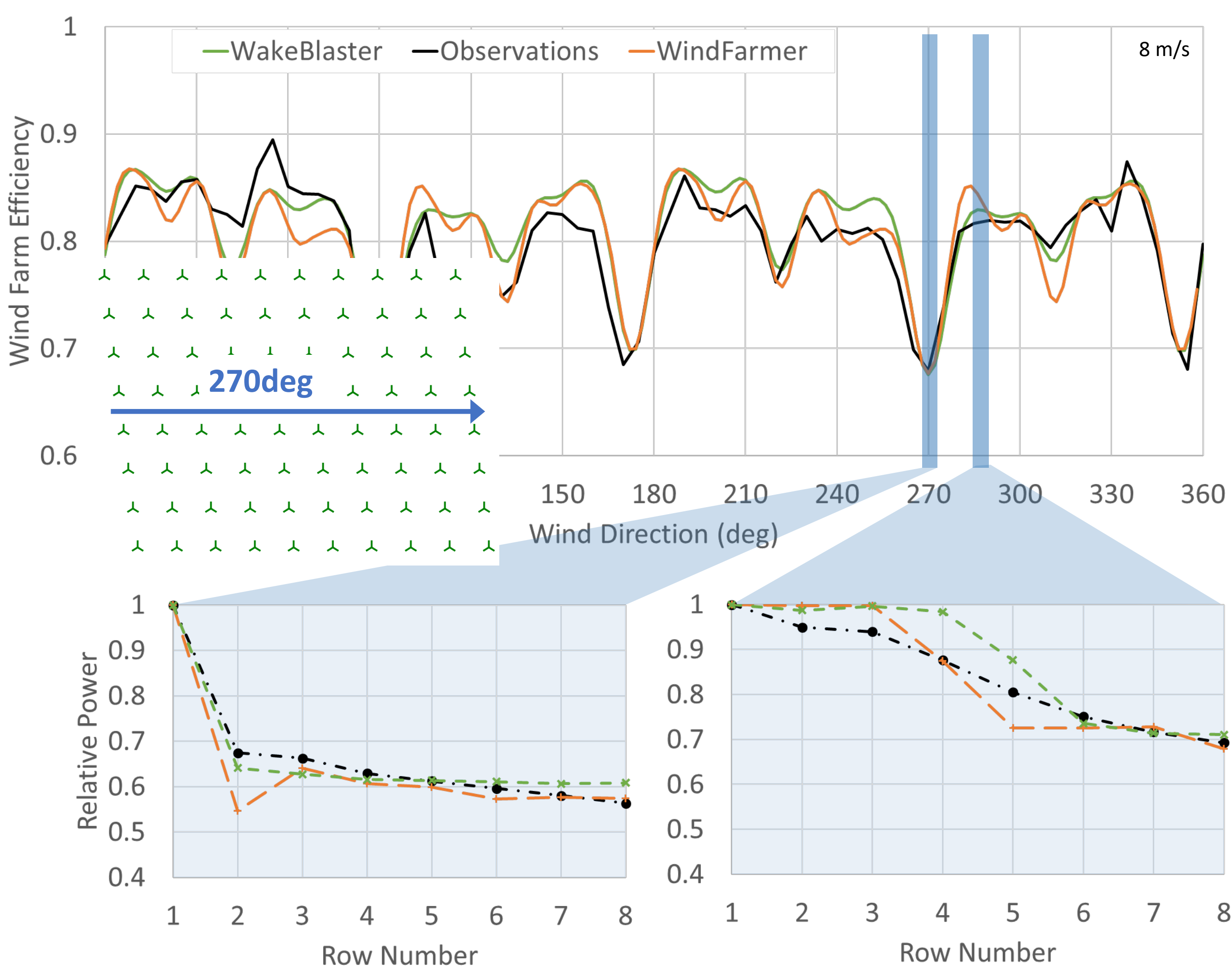
Verification – Simulation Time

The single-core simulation cost of WakeBlaster increases linearly with wind farm area. As a verification study, WakeBlaster was run on many hypothetical wind farms in a square grid layout with 5 diameter spacing between the turbines.



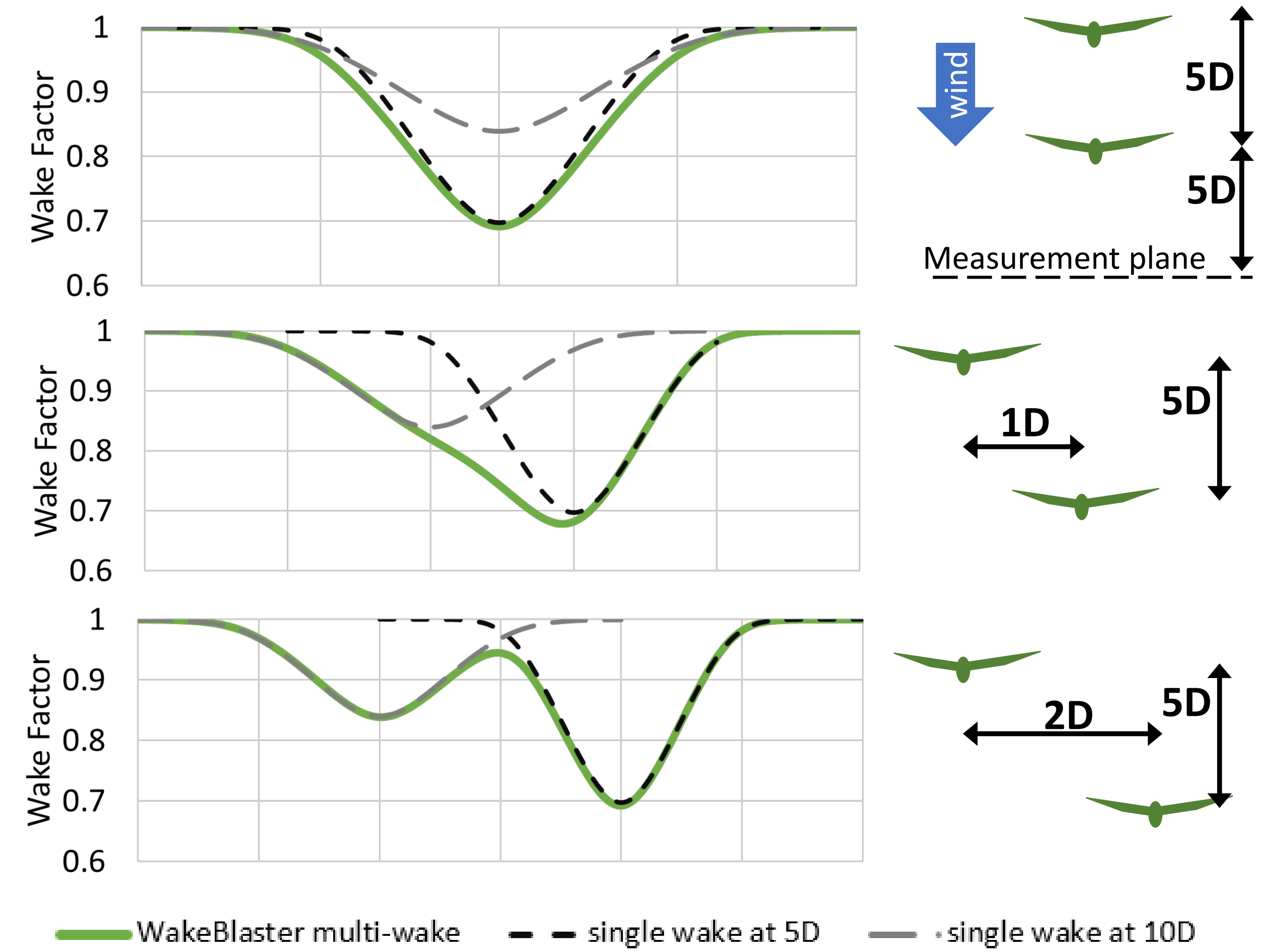
Validation – Horns Rev

Horns Rev is an offshore wind farm located in the North Sea off the coast of Denmark. It has 80 turbines at a spacing of 7D.



Verification – Wake Superposition

WakeBlaster's 3D wake model allows natural wake superposition whereas single turbine wake models must apply semi-empirical superposition afterwards.



Validation – Lillgrund

Lillgrund is an offshore wind farm located in Swedish waters in the Baltic Sea. It has 48 turbines at a notably close spacing of 3.3 – 4.3D.

