

Interactive comment on “Extreme Wind Shear Events in US Offshore Wind Energy Areas and the Role of Induced Stratification” by Mithu Debnath et al.

Anonymous Referee #1

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It is a well written manuscript dealing with adverse meteorological conditions of high wind shear off-shore in an wind resource lease area on the east coast of the US. There is considerable interest for adverse meteorological conditions due to the rapid developments of the off-shore wind farms in the US. As such the analysis of the data is very relevant and of considerable interest for the wind energy industry.

From a more general point of view of applied science, I find the discussion on the use of the shear exponent in LLJ and high wind shear conditions very important. The observation in the manuscript, that the shear coefficient (usually denoted alpha) is not a good measure of the extreme wind shear conditions that might pose problems

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to wind turbines is very important, because the use of the shear exponent (alpha) is recommend in the IEC (2019) standard. I therefore suggest putting more emphasis on this shortcoming of the shear exponent and even mention the finding in the abstract.

Here are some specific comments:

1. Lines 180 – 190 and table 2. With an uncertainty of 0.1 degree C on the temperature plus any unknown bias in the temperature measurements, it is not reasonable to give the temperature with 3 decimals. Furthermore the difference in temperature between the two sites is within the uncertainty of the observations. This makes these findings scientifically weak, dubious and non-convincing. I suggest simply to remove.
2. Line 62: VLLJ is not defined – actually why introduce VLLJ and not just name it LLJ, which is very well established meteorological phenomena.
3. Line 104: The usual and well established drop off is 2 m/s, please comment on this in the manuscript and explain why this generally accepted value is not applied here.

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