

# ***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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