

## Review of AMT-2024-37

I think the manuscript is improved from its original version, thanks to the Authors' effort and also thanks to the comments of the original Referees. I nevertheless believe that during the revision process some of the sentences were left incomplete (some are listed below) and I would suggest the authors to give a thoughtful read to the whole manuscript, to make sure all the sentences are complete. I am not sure the algorithm is easily reproducible by the scientific community (but I appreciate the availability of the algorithm through the authors' Git Hub). I encourage the authors to find places in the manuscript where to make the steps involved in the process as clear as possible. There are several options, also listed by the authors, to further improve the algorithm, which are left to future research. One suggestion I might have for future research would be to find a dataset with collocated LiDARs' measurement (or intensive radiosonde launches) to use for validation of your results. This would make your results more robust.

### Specific comments:

Abstract, page 1, line 18: Please reword "light results".

Page 2, lines 5862: It seems that this sentence is missing a correct structure "*The Mid-Atlantic NLLJ, while analogous to the SGP NLLJ in its reliance on inertial oscillation theory combined with the influence of temperature gradients induced by sloping terrain (Shapiro et al., 2016); however, with lower wind-speed maximums and vastly different topographic influences, with the Appalachian Mountains to the East and North, the Chesapeake Bay and Atlantic Ocean to the West, and the Coastal Plains and Piedmont region in between.*" Please rephrase.

Page 2, Figure 1, caption: Please, describe "x" when referring to panel B, not to panel A. Also reword: "*horizontal wind speed from (black circle)*" with something like: "*horizontal wind speed from the location denoted by the black circle in panel A*". Finally specify that panel C shows observations.

Page 4, line 109: Specify that the "*location reference*" is denoted by the black circle in panel A of Figure 1.

Page 4, line 114: "*The grey lines indicate the areas where the BELT daily file was available*". Did you mean "*The grey lines indicate the times when the BELT daily files were available*".

Page 5, lines 139-140: This sentence seems incomplete "*The conceptual model of the detection method presented here relies on single measured points in vertical and temporal space that with the multiple dimensions of the dataset*". Please correct.

Page 5, Figure 3, caption: This caption does not make sense.

Page 5, line 145: "*previously reported*" what?

Page 6, lines 157-159: "*50 events that contained no low-level wind maxima that contain low-level wind maxima that we do not consider as LLJ relevant to this study for reasons of direction, or evolution*". Please rephrase.

Page 6, Figure 4, caption: The caption does not help to identify the different portions of the algorithm. I think the execution loop is on the top (green), and the training on the bottom (orange), not left and right.

Page 6, line 167: *“These were determined These parameters (or features)”*. There is some problem with this sentence. Please correct.

Page 7, lines 203-204: *“we have identified 90 warm-season (May – September) NLLJ events using the Beltsville, MD RWP datasets over a 5-year period (2017 - 2021),”*. You just said this a few lines above.

Page 8, lines 218-220: *“such as those by conducted by Sullivan et al.”*. Please correct.

Page 8, lines 224-226: *“true negatives (top left quadrant: green), true positives (bottom right quadrant; green), false positives (top right quadrant; orange), and false negatives (bottom left quadrant: orange)”*. I think you assigned opposite locations to these case in the caption of Figure 5.

Page 9, line 241: *“as noted by the circles and dashed boxes in Figure 1”*. Did you mean Figure 6?

Page 10, Figure 6, caption: *“panel 1 shows the isolated NLLJ, panel 2 shows the horizontal wind speed and panel 3”*. Change to *“panels A1, B1, and C1 show the isolated NLLJ, panels A2, B2, and C2 show the horizontal wind speed and panels A3, B3, and C3”*.