Review Comments to the manuscript on "**A feasibility study to Reconstruct Atmospheric Rivers using space and ground-based GNSS observations"** submitted to Journal of AMT.

Overall Comment:

The manuscript attempts to highlight the results of an important feasibility study on reconstruction of atmospheric rivers (ARs), known to be a chief source of bulk of atmospheric water vapour transport from tropics to mid-latitude regions. The study resorts to use of both space-based as well as ground-based GNSS observations within the framework of machine learning NN architectures. The subject of the study is quite significant and the use of ML based exploratory nature of the work is relevant given the surge in the use of ML techniques in recent times. The study is meticulously planned, thoroughly detailed and thoughtfully implemented, even if for a localized region of study with a signature of AR. The craftsmanship with NN architectures is well appreciated, though study with some of the advanced ML approaches, e.g. ensemble learning etc. would have been comparative. Authors are admonished to think of it as future scope of the work. Nevertheless, the study highlights the potential effectiveness of GNSS RO data when used additionally with ground based networks. The manuscript is well-written, organized nicely and representations are clear. The manuscript is recommended for publication after a few suggested modifications as illustrated in "Detailed major comments" and "other minor comments" below.

Detailed major comments:

1. In figure 1, what is the grid resolution of the ECMWF 12 h forecast? It must be mentioned in the text. A similar structure with a long streak is seen in red below the rectangle. What objective basis is used by the authors to identify the AR in figure 1? Justification required. Sub-section 2.1 needs to be strengthened with substantive basis and characterization of AR scenarios in terms of parameters to distinguish them from other features of similar nature.

2. In sub sub-section 3.1.1, authors highlight the results for 65^{o} inclination but the same are not shown in either figures 2 (shows 70^{o}, 80^{o}, 90^{o} and 100^{o} inclinations) or figure 3 (85^{o} inclination). Authors to re-draw the figures 2 and 3 to incorporate the results for 65^{o} inclination also.

Other minor comments:

1. Line 12: Expand the acronym "GNSS" as it ought to be when used for first time. In Line 39: correct practice is to put the acronym in parenthesis and expanded form outside and not the vice versa.
2. Line 46: remove comma after the word "power".
3. Line 48: Put an apostrophe after "GNSS constellations".
4. Line 49: Remove comma after "coverage".
5. Line 50: remove "and".
6. Line 65: Mention the time period used to compute the "average flow…" from the source NOAA, 2023. Remove comma after "river".

7. Line 91: Correct “Similarly” to “Similar”.
8. Line 118: Same as suggested in minor comment (1) but for ECMWF.
9. Line 159, 160: Correct the sentence. Put apostrophe after the word “constellations”.
10. Line 166: Once defined, use the acronym “AR” everywhere.
11. Line 196: AR region longitude range to be corrected in conformity with figure 1.
12. Line 197, 198: remove comma after “85º” and after “planes”.
13. Line 297: correct the syntactic error in the sentence “This makes … related caused ...”. Also remove the comma after “implementation”.
14. Line 329: add the clause “in the given order” after “5 constellations”.