The paper entitled 'Validation of Copernicus Sentinel-3/OLCI Level 2 LAND Integrated Water Vapour product by Niilo Kalakoski. Geophysical validation of the Integrated Water Vapour (IWV) from Sentinel-3 Ocean and Land Colour Instrument (OLCI) was performed as a part of "ESA/Copernicus Space Component Validation for Land Surface Temperature, Aerosol Optical Depth and Water Vapour Sentinel-3 Products" (LAW) project. The IWV was compared with reference observations from two networks: GNSS (Global Navigation Satellite System) derived precipitable water vapour from the SUOMINET network and integrated lower tropospheric columns from radio-soundings from the IGRA (Integrated Radiosonde Archive) database. The obtained results for cloud-free matchups overland with a high correlation against the reference observations SUOMINET as well as IGRA. Space based IWV have inherent uncertainties and need to be validated time to time basis before in operational or making the data in repository for future research. In that respect the present study have a high potential for publication after incorporation of the comments/suggestions as given below:

MAJOR REVISIONS:

1. **No discussion of other satellites that provide IWV in the introduction (e.g. MODIS, SCIAMACHY, GOME-2, AIRS).**
2. **Details about retrieval algorithm of Sentinel-3/OLCI Level 2 LAND Integrated Water Vapour product are missing and also give references i.e.**

i) **How does Sentinel-3/OLCI provide LAND IWV data?**

ii) **How is Sentinel-3/OLCI LAND IWV level2 data product generated?**

iii) **How is Sentinel-3/OLCI LAND IWV level2 data different from radiosonde (**IGRA) **and GNSS in measuring/estimating IWV?**

iv) **Are there any limitations of Sentinel-3/OLCI LAND IWV level2 data product based on former evaluation study (more literature reviews are needed).**

v) **What is the horizontal resolution of IWV derived from Sentinel-3 OLCI LAND IWV level2 data?**

vi) **Which method was used to identify cloud free pixels?**

3. **Line-76: Give references.**
4. **Section 3.1 & 3.2:** You have used Radiosonde & GNSS data as reference for comparison with **OLCI Level 2 LAND IWV**. But the Radiosonde & GNSS based data also associated with errors. Explain the possible sources of errors in your analysis with references.

5. **For IWV matchups a macro pixel of 31 × 31 OLCI pixels (i.e. a surface of around 10 by 10 km) with central pixel over each reference station is extracted at each overpass. What is horizontal resolution of OLCI IWV products and why you have selected 31x31 pixels? Have you applied any interpolation technique for resampling of OLCI IWV data over reference?**

Specific Comments:

6. All ground-based measurements acquired in a time window of +/- 3 hours are considered.

   It is not clear here in matchup criteria of time window of +/- 3 hours you considering for radiosonde (IGRA) or GNSS. Kindly mention time window for radiosonde (IGRA) for consideration of data along with which UTC data have been utilized for this study and same for GNSS also.
7. Missing satellite observations were only filtered from the database in the case of operational issues or radio frequency interference (RFI) contamination.

   How radio frequency interference (RFI) contamination occur in your data?

8. For all matchups, we applied an additional quality check according to quality flags. The matchups with failed inversion (WV_FAIL flag set) or with cloud warning flag (CLOUD), were discarded.

   For this study, you have chosen data from Sentinel-3 OLCI LAND IWV during cloud free pixel only then why again applied additional quality check. Please clarify.

9. For each matchup, the satellite-reference observation pair with smallest time difference was chosen. For SUOMINET, matchups with time differences larger than 15 minutes, or nominal error larger than 2 kg/m2 were not used.

   Kindly give the references.
10. The dispersal of the differences is considerably higher for IGRA matchups, partly due to longer time differences allowed, and the drift of the sondes during the ascent.

    Higher differences may due to the radiosonde ascents drift and vertical extent will be different over different geographical domains. Similarly, the collocations matchups of clear sky pixel retrievals will vary and hence the differences values also vary latitudinal.

11. Observed in SUOMINET comparisons, the bias reduction can be related to radiosonde data or to collocation criteria. General comparisons also indicate very good agreement between OLCI-A and -B.

    What is retrieval algorithm of IWV of OLCI-A and -B. How bias can be reduce and related to radiosonde data.

12. Line120: INLAND_WATER water pixels, representing rivers and lakes, similarly show wet bias and large dispersal.

    Give references.

13. The dependency observed for latitude and solar zenith angle is related to generally higher water vapour total columns seen in low latitudes and solar zenith angles,while the seasonal cycle is consistent with the over-presentation of northern hemisphere stations and higher total columns during summer months.

    Give some prove or reference for this claim?

14. Line 161-168: OLCI observations classified as water surfaces (WATER and INLAND flags, including TIDAL with WATER) considerably larger bias and dispersal than those classified as land surfaces (LAND 165 flag, including TIDAL with LAND).

    OLCI observations in pixels data contains both sea and mountainous land together along with topographically diverse terrains around these stations may introduce large bias.

Technical Corrections:

Line 90: May need prove reading carefully.