Validation experiment for the Atmospheric Dynamic Mission–Aeolus

Abstract

We present the implementation plan for validation experiment of the ADM–Aeolus wind product. We plan to make NICT Doppler wind lidar (DWL) and wind profiler radar (WPR) wind measurements with a spatiotemporal resolution better than those from the ADM–Aeolus will be made at 5:30–6:30 and/or 17:30–1830 LT in Japan (Tokyo, Kobe, and Okinawa). Wind measured by DWLs and WPRs will be compared with the ADM–Aeolus wind product. First analysis will be conducted for comparison with LOS wind speed measured with low temporal and spatial resolutions. Temporal and spatial resolution criteria and co-location criteria will be discussed on the basis on statistical analysis. The ADM–Aeolus wind will be compared statistically with high temporal and spatial resolutions. We also plan to make NICE aerosol lidar measurements at 5:30–6:30 and/or 17:30–1830 LT in Tsukuba. We will compare NICE aerosol data with L2a and L2b aerosol of the ADM–Aeolus. We present the implementation plan for validation experiment of the ADM–Aeolus aerosol products. First statistic results will be delivered in about several months after the ADM–Aeolus launch.

Objective

- Uncertainties due to the horizontal resolution for ADM wind and aerosol products and to the validation coincidence criteria need to be investigated for data quality control.
- And also, small temporal and spatial variations of atmospheric field need to be for data quality control.
- NICT and NIES observe wind and aerosol profiles in the atmospheric boundary layer and middle/upper troposphere.
- Objectives of our proposal are validates wind and aerosol data measured by the ADM–Aeolus through the atmospheric boundary layer and up to the middle/upper troposphere.

Step, step, step...

First analysis will be collected for comparison with HLOS wind speed measured with low temporal and spatial resolutions (ex., <100 km and <15 minutes).

Aerosol products provided by AD-Net will be used for comparison with ADM–Aeolus derived L2a aerosol products as follows:
- Scene classification products (e.g., aerosol or cloud layers)
- Aerosol optical properties of α, β and S

Implementation plan

<table>
<thead>
<tr>
<th>Year</th>
<th>JFM/2018</th>
<th>AMJ/2018</th>
<th>JAS/2018</th>
<th>OBD/2018</th>
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</thead>
<tbody>
<tr>
<td>Preparation</td>
<td>Check schedule</td>
<td>Check schedule</td>
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<tr>
<td>LIDAR</td>
<td>16.0 μm, 2 mm, 3 mm, 5 mm, 7 mm</td>
<td>16.0 μm, 2 mm, 3 mm, 5 mm, 7 mm</td>
<td>16.0 μm, 2 mm, 3 mm, 5 mm, 7 mm</td>
<td>16.0 μm, 2 mm, 3 mm, 5 mm, 7 mm</td>
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<tr>
<td>WIND PROFILER</td>
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<td>16.0 μm, 2 mm, 3 mm, 5 mm, 7 mm</td>
<td>16.0 μm, 2 mm, 3 mm, 5 mm, 7 mm</td>
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Summary

ADM–Aeolus CAL/VAL activities in Japan and implementation plan for validation experiment are presented in the presentation.

- NICT ADM–Aeolus CAL/VAL team
  - Observation window: 5:30–6:30 and/or 17:30–1830 LT
  - Tokyo work package
    - 2–μm DWL (temporal operation) and WPR (24 hours/7 days operation)
    - Kobe work package
      - 1.6–μm DWL (24 hours/7 days operation)
      - Okinawa work package
    - 1.6–μm DWL (24 hours/7 days operation) and GPS–radio sonde (temporal operation)
  - Aerosol work package
    - MRL, MMRL, NSEL (24 hours/7 days operation)
  - Data comparison
    - ADM–Aeolus wind data averaged with low and high resolutions.
    - Wind measured by grand-based DWLs and WPRs
    - Aerosol observed by grand-based MRL, MMRL, and WPR
  - Statistical results will be given for the three wind fields.