GOES-16 ABI L2+ Derived Motion Winds (DMW) Release, Beta Data Quality
June 23, 2017
Read-Me for Data Users

The GOES-R Peer/Stakeholder Product Validation Review (PS-PVR) for the Advanced Baseline Imager (ABI) L2+ Derived Motion Winds (DMW) Beta Maturity was held on June 9, 2017. As a result of this review, the PS-PVR panel recommended that the ABI DMW product be declared Beta.

The GOES-R ABI DMW product is generated from a sequence of images and provides an estimate of atmospheric motion (Speed, Direction, Height) for a set of targeted tracers (cloud edges or moisture gradients in clear air conditions) viewed in selected spectral bands. Winds are retrieved separately from ABI bands 2 (0.64um), 7 (3.9um), 8 (6.2um), 9 (6.9um), 10 (7.3um), and 14 (11.2um). Collectively, the winds retrieved from all of these bands make up the DMW product. The DMW product is generated once an hour for every ABI Full Disk (FD) of the Earth, every 15 minutes over the Continental United States (CONUS) region, and every 5 minutes over the Mesoscale (MESO) regions.

A full description and format of the DMW product can be found in the Product Definition and User's Guide (PUG) document (http://www.goes-r.gov/products/docs/PUG-L2+-vol5.pdf). The algorithm used to derive the DMW product from GOES-16 ABI observations is described in detail in the "GOES-R Advanced Baseline Imager (ABI) Algorithm Theoretical Basis Document for Derived Motion Winds" (http://www.goes-r.gov/products/ATBDs/baseline/Winds_DMW_v2.0_no_color.pdf).

Beta maturity, by definition, means that:

- Rapid changes in product input tables / algorithms can be expected;
- Product quick looks and initial comparisons with ground truth data were not adequate to determine product quality;
- Anomalies may be found in the product and the resolution strategy may not exist;
- Product is made available to users to gain familiarity with data formats and parameters;
- Product has been minimally validated and may still contain significant errors; and
- Product is not optimized for operational use.

Beta users bear all responsibility for inspecting the data prior to use and for the manner in which the data are utilized. Persons desiring to use the GOES-16 ABI Beta maturity DMW products for any reason, including but not limited to scientific and technical investigations, are encouraged to consult the NOAA algorithm working group (AWG) scientists for feasibility of the planned applications. The DMW product is sensitive to upstream processing that includes the quality of the calibration, navigation, cloud mask, cloud phase, and cloud top pressure.

Known product issues being resolved include:

1. Missing values occur randomly due to upstream L1b issues;
2. Generally, the ABI Image Navigation and Registration (INR) performance is good, but occasional large anomalies can occur which can result in significant reductions and/or degraded quality in the DMW product;
3. The clear air water vapor winds computed from ABI bands 8, 9, and 10 are not being generated over the Full Disk in Mode 3.

4. The DMW product final product quality flag does not properly reflect the Quality Indicator (QI) values assigned to each retrieved wind. Some poor quality DMW products can be flagged as good winds.
5. The quality of the DMW products below 700 hPa are suspect. The speeds and directions of these DMWs can vary significantly from winds obtained from other observing systems (e.g., rawinsondes, other satellites). The DMW counts and geographic coverage at low levels are noticeably poor.
6. The heights assigned to some upper level (near 200 hPa) DMWs are too high up in the atmosphere. This contributes to significant slow speed biases at these levels. The heights assigned to some middle level (near 500 hPa) DMWs are too low in the atmosphere. This contributes to significant fast speed biases at these levels.
7. Lack of low level visible winds in regions covered by very thin cirrus.