

GOES-16 ABI L2+ Derived Motion Winds (DMW) Release,  
Provisional Data Quality  
February 9, 2018  
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) Provisional Maturity was held on February 9, 2018. As a result of this review, the PS-PVR panel recommended that the ABI DMW product be declared Provisional.

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](http://www.goes-r.gov/products/ATBDs/baseline/Winds_DMW_v2.0_no_color.pdf)).

Provisional maturity, by definition, means that:

- Validation activities are ongoing and the general research community is now encouraged to participate.
- Severe algorithm anomalies are identified and under analysis. Solutions to anomalies are in development and testing.
- Incremental product improvements may still be occurring.
- Product performance has been demonstrated through analysis of a small number of independent measurements from select locations, periods, and associated ground truth and field campaign efforts.
- Product analysis is sufficient to establish product performance relative to expectations.
- Documentation of product performance exists that includes recommended remediation strategies for all anomalies and weaknesses. Any algorithm changes associated with severe anomalies have been documented, implemented, and tested.

Persons desiring to use the GOES-16 ABI Provisional maturity DMW products for any reason, including but not limited to scientific and technical investigations, are encouraged to consult the NOAA/NESDIS/STAR 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 type/phase, and cloud top pressure.

Status current DMW product and any remaining known issues that are being resolved:

1. The DMW product performance has improved significantly since it was declared Beta

maturity on June 8, 2017.

2. Summary of the measured performance of the DMW product as measured against reference data:
  - Accuracy specification (7.5 m/s) are easily met for all winds generated from each of the ABI bands (i.e., Bands 2, 7, 8 (Cloud Top Water Vapor), 8 (Clear-sky Water Vapor), 9-10 (Clear-Sky Water Vapor), and 14)
  - Precision specification (4.2 m/s) are met for winds generated from ABI bands 2, 7, 8 (WVCT), 10 (CSWV)
  - Precision specification exceeded slightly for winds generated from ABI bands 8-9 (CSWV).
  - Precision specification exceeded slightly for winds generated from ABI band 14 and winds in the 300-500mb layer are the largest contributor for this.
3. Further improvements to the DMW and cloud height algorithms have been identified and demonstrated that are expected to further improve the DMW product for target scenes involving thin cirrus and result in the DMW product meeting the precision specification for winds generated from all ABI bands.
4. The file creation timestamp is the beginning of processing on the system rather than the time of the images being used. This will be updated so that the different channel files have the same creation time based on the files used. This will benefit users who use the timestamp for visualization purposes.
5. Within the file metadata "Scene\_ID" is always labeled as 'Mesoscale' instead of delineating between meso1 and meso2 like for other L2 products. This will be corrected so that the user knows which meso box is being looked at when examining the file.

Contact for further information: OSPO User Services at [SPSD.UserServices@noaa.gov](mailto:SPSD.UserServices@noaa.gov)

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