

## News: Version 3 Release

Dear Colleagues,

As many of you know, a new processing and data management system for AERONET has been under development for more than three years. We have been operating **Version 2 (Ver. 2)** since 2006. On June 21, David Giles announced at the Kaufman Symposium the release of **Ver. 3** near real-time AOD. We have maintained the same convention of data processing: **Level 1.0** (near real-time basic processing), **Level 1.5** near real-time (screening for clouds and data anomalies) and **Level 2.0** (post field calibration applied, final quality assured products and data values locked). Following is a summary of some of the most important points and differences to expect in **Ver. 3**. Note there are many nuances to the **Ver. 3** processing not covered in this summary. For a more comprehensive treatment, see the web links to [Ver. 3 details \(under construction\)](#) and [David Giles et al.](#) symposium presentation. Descriptions will be updated periodically.

### What is different in Ver. 3 AOD?

**Level 1.0:** Minor corrections, selective high AOD restoration applied to all levels

**Level 1.5:** Improved cloud clearing, high air mass data included, and automatic data quality assurance applied

**Level 2.0:** Manual QA replaced by automatic QA

### What are the implications for the user of Ver. 3 AOD:

**Level 1.0:** Minor difference, captures fine mode aerosol plumes at very high AOD. Latency of ~30 minutes or less from the time data are received for processing.

**Level 1.5:** Latency of 30 minutes or less from the time data are received for processing. Less cloud contamination, less instrumental anomalies, and more accurate data. Because the cloud clearing is improved and a series of automatic quality assurance algorithms are further removing compromised data, the level 1.5 may be close to level 2.0. AERONET's recommendation is that level 1.5 should provide excellent data near real time operational comparisons such as for satellite and model validation and for model assimilation. Note that all level 1.5 products are reprocessed multiple times within the first several weeks to utilize the most recent and best ancillary inputs that originate from satellites, radiative transfer models and reanalysis models for both AOD and inversion products. The Level 1.5 products may or may not change during the first six weeks after data collection and/or after a post field calibration is applied prior to Level 2. Thus we do not recommend using level 1.5 data for publication.

**Level 2.0:** Manual QA has been replaced by Automatic QA, no latency in Level 2.0 designation. The database is too large for manual QA. By implementing automatic QA algorithms, Level 2 is generated immediately after the post field calibration is applied.

### **What is different in Ver. 3 Inversion retrieval products?**

**Level 1.5:** Full QA criteria except there are no AOD limitations (as in Ver. 2), improved ancillary inputs, scalar RT code, multiple processing as inputs become available. Uncertainty estimates.

**Level 2.0:** Post field calibrated, full QA, vector RT processing, uncertainty estimates.

### **What are the implications for the user of Ver. 3 inversion retrieval products?**

Note: There is no Level 1.0 inversion retrieval products as basic criteria must be met to achieve a credible inversion.

**Level 1.5:** A latency of ~3 hrs for processing can be expected from the time data are received for processing. Improved inputs include MODIS BRDF, OMI NO<sub>2</sub> and MERRA-2 aerosol extinction, water vapor and ozone profiles. Note that all level 1.5 products are reprocessed multiple times within the first several weeks to utilize the most recent and best ancillary inputs that originate from satellites, radiative transfer models and reanalysis models for both AOD and inversion products. The Nakajima scalar RT code will be used to conserve processing time until the final input is received then a final reprocessing with a Successive Orders vector code will be run. The Level 1.5 retrieval products may or may not change during the first six weeks after data collection and/or after a post field calibration is applied prior to Level 2. Thus we do not recommend using level 1.5 data for publication.

**Level 2.0:** Final calibration and rerun SO vector code RT. Note that Level 2.0 products will be computed for all optical depths but as in Ver. 2 SSA and complex index of refraction will be limited to AOD greater than 0.4 at 440 nm.

### **Version 3 timeline: Expected to be fully implemented by Dec, 2016:**

Level 1.0 AOD: Current and available

Level 1.5 AOD: Current and available; recommended for near real-time applications but not publications.

Level 2.0 AOD: Estimated August 2016 release and recommended for publications.

Level 1.0 Inversions retrieval products: August 2016

Level 1.5 Inversion retrieval products: August 2016

Level 2.0 Inversion retrieval products: December of 2016 to fully reprocess the 23-year data archive

New products will be vetted and introduced during the lifetime of Ver. 3. These will include Lunar AOD and Hybrid inversions among others.

**Version 2.0 will be fully supported and processed through December 2017 after which time all data will be locked and archived.**