

LP-L1G-EV – Version 2 Data Release Notes

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The OMPS Limb Profiler (LP) instrument measures radiance scattered from the Earth's limb, viewing backwards along the NPP orbit track. Measurements are made simultaneously using three parallel vertical slits, where the left and right slits are each separated horizontally by 4.25° (approximately 250 km at the tangent point) from the center slit. OMPS LP uses a 2-D CCD detector, so that each observation collects radiance information over an altitude range of 0-80 km (sampling = 1 km, resolution \approx 1.6 km) and a wavelength range of 290-1000 nm (resolution varies from 1 nm at UV wavelengths to \sim 30 nm at IR wavelengths). The optical design of the LP instrument results in non-orthogonal wavelength and altitude registration of Level 1B radiance data for each image on the CCD (known as “spectral smile” and “spatial smile”). Since many retrieval algorithms for Level 2 products are designed to work with input data in a rectangular wavelength-altitude grid, we create the Level 1 gridded Earth view (L1G-EV) product for this purpose. Radiance values for a given event are interpolated to a fixed wavelength and altitude grid, using a logarithmic bilinear routine to handle the non-uniform wavelength sampling. A single L1G data file is created for each OMPS LP orbit.

Changes from Version 1 to Version 2

Numerous changes have been implemented for the LP Version 2 gridded radiance product from the Version 1 product. These changes are summarized below.

- The product name has been changed from LP_SDR_EV_GRID to LP-L1G-EV.
- The pointing error for the right slit has been corrected.
- Spectral shifts due to temperature variations are now corrected using a seasonal term (based on the day of year for each measurement) and an intra-orbit term (applied within each orbit).
- The static tangent height adjustment applied to every measurement has been increased to 1.45 km, 1.75 km, and 2.6 km for the left, center, and right slits respectively. In addition, an intra-orbit tangent height adjustment is now applied within each orbit.
- The wavelength grid is now constant for each orbit.
- Each gridded radiance value is now selected from the available ungridded L1B pixel data, using only the aperture that is most appropriate for the wavelength of the specified grid point. In Version 2, the selection uses large aperture data for UV measurements (wavelengths less than 495 nm) and small aperture data for visible and IR measurements (wavelengths greater than 495 nm). In the Version 1 product, the gridded radiance values merged data from both apertures when each aperture had a valid sample at the grid point.
- Fill values are now reported where insufficient valid L1B pixels are available for bilinear interpolation. In Release 1, such cases either used estimated radiance values or did not report a profile at that wavelength.

Data Coverage. The first OMPS LP measurements were taken on January 10, 2012. LP data for January-March 2012 have numerous gaps due to variations in instrument operations and changes in sample tables. Regular operations began on April 2, 2012. Note that there is very little or no LP data on days when the OMPS Nadir Mapper conducts high-resolution measurements. This sequence occurs approximately one day per week, beginning in April 2012.

Citation Format

Publications that reference these data should include the following citation:

“OMPS LP Version 2 gridded radiance data are produced by the LP processing team (DOI 10.5067/suomi-npp/omps-limb/11-ev-grid/data12)”.