H SAF MW-only precipitation products are based on the exploitation of all MW radiometers onboard LEO satellites. They provide Level 2 instantaneous precipitation rate, at a nominal resolution depending on the radiometric characteristics. MW-only gridded products, based on merged precipitation estimates available from the MW radiometer constellation, are in development phase.

H68 is a near real-time Level 3 product providing precipitation rate on a regular grid (0.25°×0.25°) at regular time intervals (30 minutes). It is based on instantaneous precipitation rates available from the H01, H02B, H18, H-AUX-17, H-AUX-20 products. At each 30-min interval, all overpasses of MW radiometers over the MSG full disk area (60° W – 60° E; 60° S – 70° N) are considered and a inter-calibration/merging procedure is applied to provide one precipitation rate estimate in each grid-box.

**H68 Inputs**

<table>
<thead>
<tr>
<th>Product ID</th>
<th>Data Product Description</th>
<th>Algorithm</th>
<th>Satellites/Constellations</th>
<th>Availability</th>
</tr>
</thead>
<tbody>
<tr>
<td>H68 (GMI)</td>
<td>Precipitation rate at ground (MMW combined overpasses) (GMI)</td>
<td>Physical-based approach</td>
<td>DPR/GMI</td>
<td>Operational</td>
</tr>
<tr>
<td>H68 (AUX)</td>
<td>Precipitation rate at ground (MMW combined overpasses) (AUX)</td>
<td>Neural Network</td>
<td>CDRD</td>
<td>availability based on quality of inputs</td>
</tr>
<tr>
<td>H18 (AMSR)</td>
<td>Precipitation rate at ground (MW combined overpasses) (AMSR)</td>
<td>Neural Network</td>
<td>PNPR</td>
<td>operational</td>
</tr>
<tr>
<td>H18 (GMI)</td>
<td>Precipitation rate at ground (MW combined overpasses) (GMI)</td>
<td>Physical-based approach</td>
<td>CDRD</td>
<td>operational</td>
</tr>
<tr>
<td>H18 (AUX)</td>
<td>Precipitation rate at ground (MW combined overpasses) (AUX)</td>
<td>Neural Network</td>
<td>CDRD</td>
<td>operational</td>
</tr>
</tbody>
</table>

**H68 Outputs:**

- Precipitation rate on a regular 0.25°×0.25° grid every 30 min.
- Precipitation phase and quality.
- Number of conical and cross-track satellite overpasses over each grid box (and their sum).
- Satellite type for each overpass (i.e. SSMIS, AMSU/MHS, etc.).
- Percent of occurrence of one, two and three or more satellite overpasses in each grid box in 30 minutes. Only overpasses relative to valid Level 2 precipitation rate products are shown (e.g., H-AUX-17 from AMSR2 is flagged over desert).
- The inter-tropical zone presents only one satellite overpass per grid box in 30 minutes in most cases.
- The occurrence of two or more satellite overpasses increases moving toward the polar regions.

**Example case.**

- a) Number of satellite overpasses over each grid box in the considered half-hour interval.
- b) Corresponding instantaneous precipitation rate.

H67 is a Level 3 product based on instantaneous precipitation rates available from the H68 product, providing 24-hour cumulated precipitation every 6 hours (00 06 12 18 UTC) on a regular 0.25°×0.25° grid. The integration over 24 hour time interval is performed assuming that, for each grid-box, the precipitation rate remains constant between subsequent half-hour intervals, until another MW radiometer overpass is available. The product is in development phase. It will be delivered 6-8 hours after the actual reference time (not in NRT).

**H67 Outputs:**

- Cumulated precipitation over the past 24h.
- Number of conical and cross-track satellite overpasses over each grid box (and their sum).
- Mean daily number of satellite overpasses over each grid box for 2 years data (2014-2015).
- The number decreases from the inter-tropical zone toward the Polar regions.
- Good agreement at mid-latitudes. Underestimation in northern Atlantic (Ocean and coastal regions). Overestimation over Equatorial region and over Sahara and Arabian peninsula (to be fixed).
- Stable results throughout the seasons for correlation coefficient (calculated only when H67>=1 mm day⁻¹ and ERAS>=1 mm day⁻¹) with good performances at mid-latitudes and lower performances over Equatorial region.

**Example case.**

- a) Daily number of satellite overpasses over each grid box.
- b) H67 24-h cumulated precipitation, without inter-calibration of MW Level 2 products (under development).

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