GPM Version 6 Latent Heating Products Processing/Reprocessing at PPS

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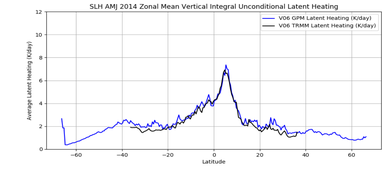
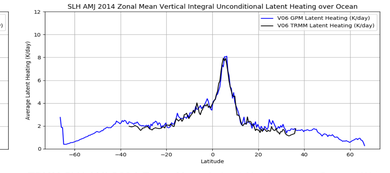
Acknowledgement to NASA Goddard Convective-Stratiform Heating (CSH) Algorithm Development Team and JAXA Spectral Latent Heating (SLH) Algorithm Development Team

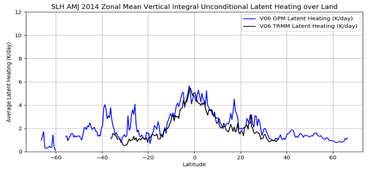
Introduction The Tropical Rainfall Measurement Mission (TRMM) has provided the precipitation information record extending back to Dec. 1997 from its Microwave Imager (TMI) and Precipitation Radar (PR). The current Global Precipitation Measurement (GPM) mission core spacecraft includes the Microwave Imager (GMI) (extending the TMI) and the Dual-Frequency Precipitation Radar (DPR) which consists of two radars: one operating at Ku-band (much like TRMM PR) and the other at Ka-band. In the GPM Version 5 reprocessing, PPS has reprocessed the TRMM era radiometer data with the retrieval algorithms based on the GPM V05 algorithms. In the GPM V06 reprocessing, PPS will reprocess the TRMM era radar data using a single frequency retrieval algorithm similar to that used for GPM Ku. With this approach, PPS will create the consistent retrieval products from December 1997 (the beginning of TRMM) through the current ongoing GPM. This 20+ years global tropical precipitation data will benefit the user community. After the reprocess, all products are in HDF5 format, all product names will use the GPM naming convention. The general overview of the changes in the reprocessed TRMM data products was described at Erich Stocker's paper "TRMM Version 8 Reprocessing Improvements and Incorporation into the GPM Data Suite" published in Journal of Atmospheric and Oceanic Technology, vol. 35, no. 6.
The NASA Goddard Convective-Stratiform Heating (CSH) Algorithm and the JAXA Spectral Latent Heating (SLH) Algorithm have been running from the TRMM era to the current GPM at PPS. In the GPM V06 processing/reprocessing for CSH, the input data is the combined TMI and PR product for TRMM and the combined GMI and DPR product for GPM; the same lookup tables for tropics and mid latitudes are applied in both TRMM and GPM latent heating programs. In the GPM V06 processing/reprocessing for SLH, the same lookup tables for tropics and mid latitudes are applied in both TRMM SLH and GPM SLH programs; the input data is the PR product for TRMM and the DPR Ku product for GPM. Through this approach, the GPM V6 processing/reprocessing will create the consistent 20+ years retrieval CSH and SLH latent heating products over the tropics and mid latitudes from December 1997 (the beginning of TRMM) through the current ongoing GPM.

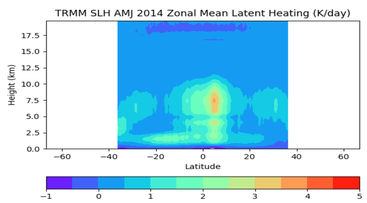
JAXA Spectral Latent Heating (SLH) program The GPM V06 TRMM SLH has been completely reprocessed and the products have been publicly distributed. The reprocess of the GPM V06 GPM SLH has been publicly released at the beginning of October. Here are the latent heating products of reprocessed TRMM and GPM SLH program.

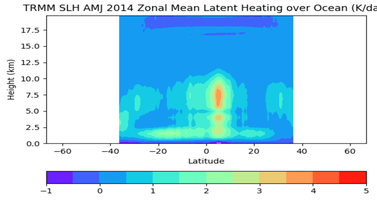
TRMM overlapped GPM in April, May and June 2014. The following figures show the agreements between the TRMM and GPM SLH latent heating.

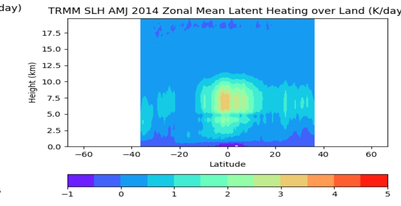


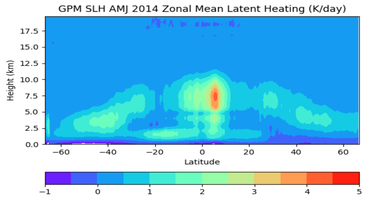


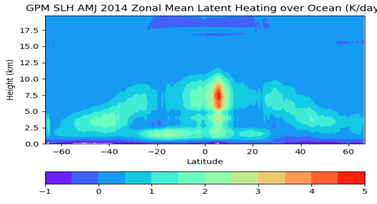


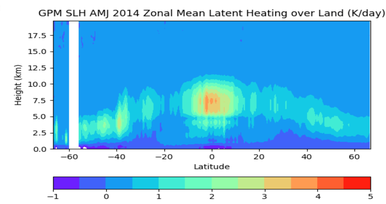


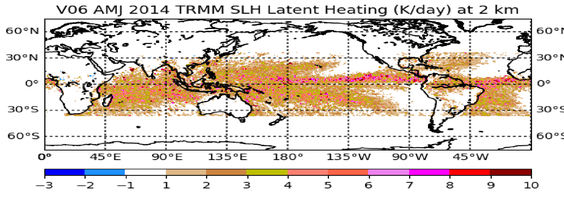


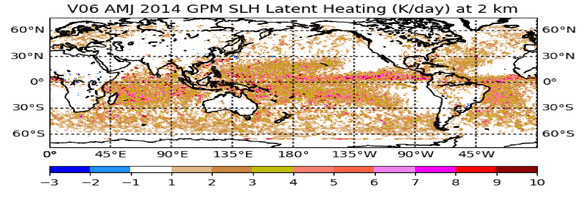


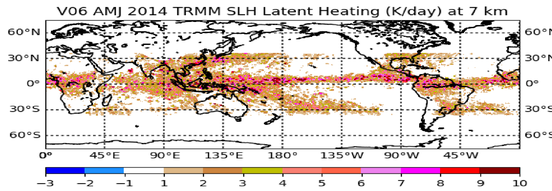


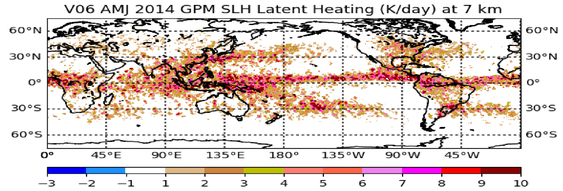






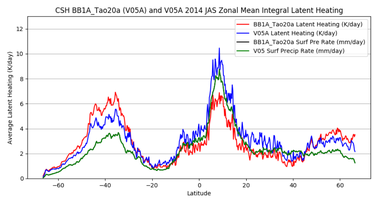


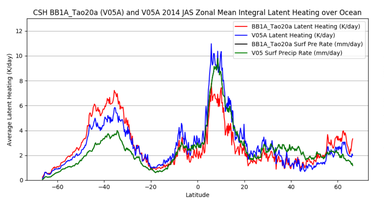


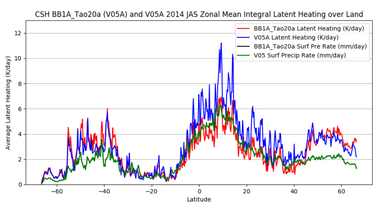


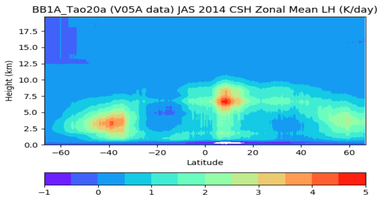
SLH Changes after the GPM V06 Reprocessing				
	TRMM V07 SLH	GPM V05 SLH	GPM V06 TRMM SLH	GPM V06 GPM SLH
File horizontal domain	37° S to 37°N 180°W to 180°E	67° S to 67°N 180°W to 180°E	67° S to 67°N 180°W to 180°E	67° S to 67°N 180°W to 180°E
Horizontal resolution	0.5° x 0.5°	0.5° x 0.5°	0.5° x 0.5°	0.5° x 0.5°
Vertical resolution	19 layers	80 layers	80 layers	80 layers
Data format	HDF4	HDF5	HDF5	HDF5

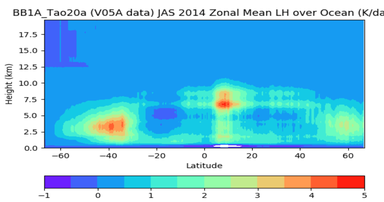
NASA Goddard Convective-Stratiform Heating (CSH) program The CSH algorithm team is working very hard to develop and improve the GPM V06 SCH programs for both TRMM and GPM. The input data are TMI and PR combined products for TRMM CSH and GMI and DPR combined products for GPM CSH. Here are the three months (July, August and September 2014) average results of the latest program with the current V05 combined data.

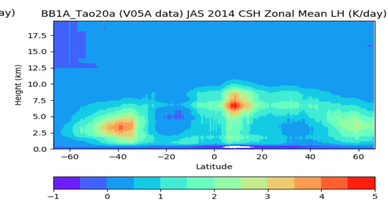


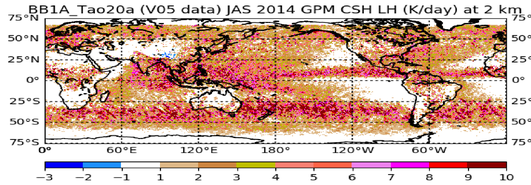


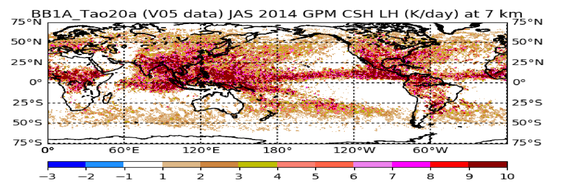












CSH Changes with the GPM V06 Reprocessing				
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Horizontal resolution	0.5° x 0.5°	0.25° x 0.25°	0.5° x 0.5°	0.5° x 0.5°
Vertical resolution	19 layers	80 layers	80 layers	80 layers
Data format	HDF4	HDF5	HDF5	HDF5

How to get the data?
All GPM products are available through the PPS "arthurhou" ftp archive: ftp://arthurhou.pps.eosdis.nasa.gov/ and STORM (PPS's Online Data Ordering Interface): https://storm.pps.eosdis.nasa.gov after these products are produced and archived. If there is any concerns, comments or questions, please contact the PPS Helpdesk at: helpdesk@mail.pps.eosdis.nasa.gov.