GPM SLH Ver.6 潜熱加熱データのパフォーマンス
Performance of the GPM SLH Ver.6: Spectral Latent Heating Estimated with GPM DPR Data

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A new version of three dimensional convective latent heating (GPM SLH ver.6) is produced for entire GPM observation region of 65N-65S, utilizing level 2 product of the GPM KuPR. The algorithm is based on the spectral LH look-up tables (LUTs) produced from a simulation of synoptic systems utilizing the Japan Meteorological Agency (JMA)’s high resolution (horizontally 2km) Local Forecast Model (LFM) for the midlatitude precipitation, as well as the LUTs produced utilizing the Goddard Cloud Ensemble Model forced with the TOGA-COARE data for tropical precipitation. The former is a new set of LUTs for GPM SLH and latter is the same as that used for the TRMM SLH. Regional separation between the midlatitude and the tropics are determined utilizing the precipitation regime classification adopted in the GSMaP algorithm. Note that an upgrade of the product version 5 and version 6 primarily resides in the improvements in precipitation type (convective/stratiform/other) classifications in the GPM DPR Level 2 products.

Three dimensional snapshots depict detailed structures of the latent heating associated with mid-latitude precipitation, such as post-frontal shallow convection (Figure). Global and regional mean latent heating profiles are also examined. First of all, a smooth connection between the tropical and mid-latitude latent heating distribution is confirmed, in addition to the different characteristics of LH profiles between in the tropics and in the midlatitudes. Latent heating profiles of ver.6 GPM SLH in typical tropical convective regions, such as TOGA-COARE region and SCYSMEX region, are very consistent with the TRMM SLH. Average profiles of estimated latent heating in a synoptic system are also consistent with those in simulation outputs. Various analysis results with this GPM SLH ver.6 data will be presented.

Furthermore, temporal average distributions of vertically integrated latent heating are compared with the surface precipitation. As a result, a good correspondence is confirmed with a slight underestimate of the GPM SLH. Further comparisons with other products such as various reanalysis data will be performed to examine the characteristics of GPM SLH as well as those of reanalysis and model outputs.

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