

## Release Notes for TRMM SLH V7A

August 25, 2015

Revised November 29, 2016

Two additional masks are applied to Version 7A SLH.

The first (rainTypeSLH=90) is for high mountains/winter mid-latitudes pixels. This new mask assigns a missing value for most of pixels that were classified as rainTypeSLH=4 in the previous version-7 SLH. This type was used mainly for Tibet and winter mid-latitude with the melting level close to the ground level.

Another (rainTypeSLH=80) for extratropical frontal system regime also has been applied, because an artificial discontinuity in winter mid-latitude were found in the previous version-7 SLH.

In summary, for rain type decided by the SLH, special values are defined as:

- 1: Convective
- 2: Shallow strat
- 3: Deep strat
- 4: Deep strat with low melting level
- 5: Intermediary
- 6: Other
- 80: Mask for Extratropical frontal system regime
- 90: Mask for Tibet, winter mid-lat etc.
- 9999: Missing value

Note that some of pixels classified as rainTypeSLH=4 still remain in the version-7A SLH, although the new masks were introduced.

In order to remove suspicious extreme rainfall profiles in PR 2A25 version-7 data, a filter developed by Hamada and Takayabu (2014) has been applied. However, it cannot remove all of them, so that some suspicious extreme profiles still remain in the version-7A SLH.

The previous version 7 SLH contained a misclassification that caused some stratiform pixels erroneously assigned to rainTypeSLH=4, and this resulted in unrealistic positive

heating at altitudes lower than the freezing level [see median volumetric latent heating from stratiform precipitation over the US and Argentina shown in Fig. 6b of Liu et al. (2015)]. This misclassification has been fixed in the version-7A SLH.

Analysis showed some isolated abnormal reflectivity profiles, these may result in non-negligible abnormal values of SLH. We conjecture this is caused by some kind of radio wave interferences from the ground. No fixes were applied to deal with this abnormal profile. This remains as a future issue.

#### References:

- Hamada, A. and Y. N. Takayabu, 2014: A removal filter for suspicious extreme rainfall profiles in TRMM PR 2A25 version-7 data. *J. Appl. Meteor. Climatol.*, **53**, 1252–1271.
- Liu, C., S. Shige, Y. N. Takayabu, E. Zipser, 2015: Latent heating contribution from precipitation systems with different sizes, depths and intensities in the tropics. *J. Climate*, **28**, 186-203, DOI: 10.1175/JCLI-D-14-00370.1.