Song, H.-J., S. Kim, S. Roh, and H. Lee, 2020: Difference between Cloud Top Height and Storm Height for heavy rainfall using TRMM measurements. *J. Meteor. Soc. Japan*, **98**, Special Edition on Global Precipitation Measurement (GPM): 5th Anniversary, https://doi.org/10.2151/jmsj.2020-044.

Plain Language Summary: This study investigates the cloud top height (CTH) and storm height (SH) characteristics of heavy rain clouds from Tropical Rainfall Measuring Mission (TRMM) measurements. Continental heavy rainfall (e.g., Central Africa and the United States) is characterized by high SH under the strong instability and relatively dry conditions. In contrast, heavy rain events in Korea and Japan are mostly related with the lowest CTH, SH, and ice water content under the thermodynamically near-neutral but humid environments, representing unique monsoon feature in the world. Similar SH and humid features are also found in the northwestern Pacific; however, this region exhibits high CTH and CTH−SH values in the highest convective instability condition.

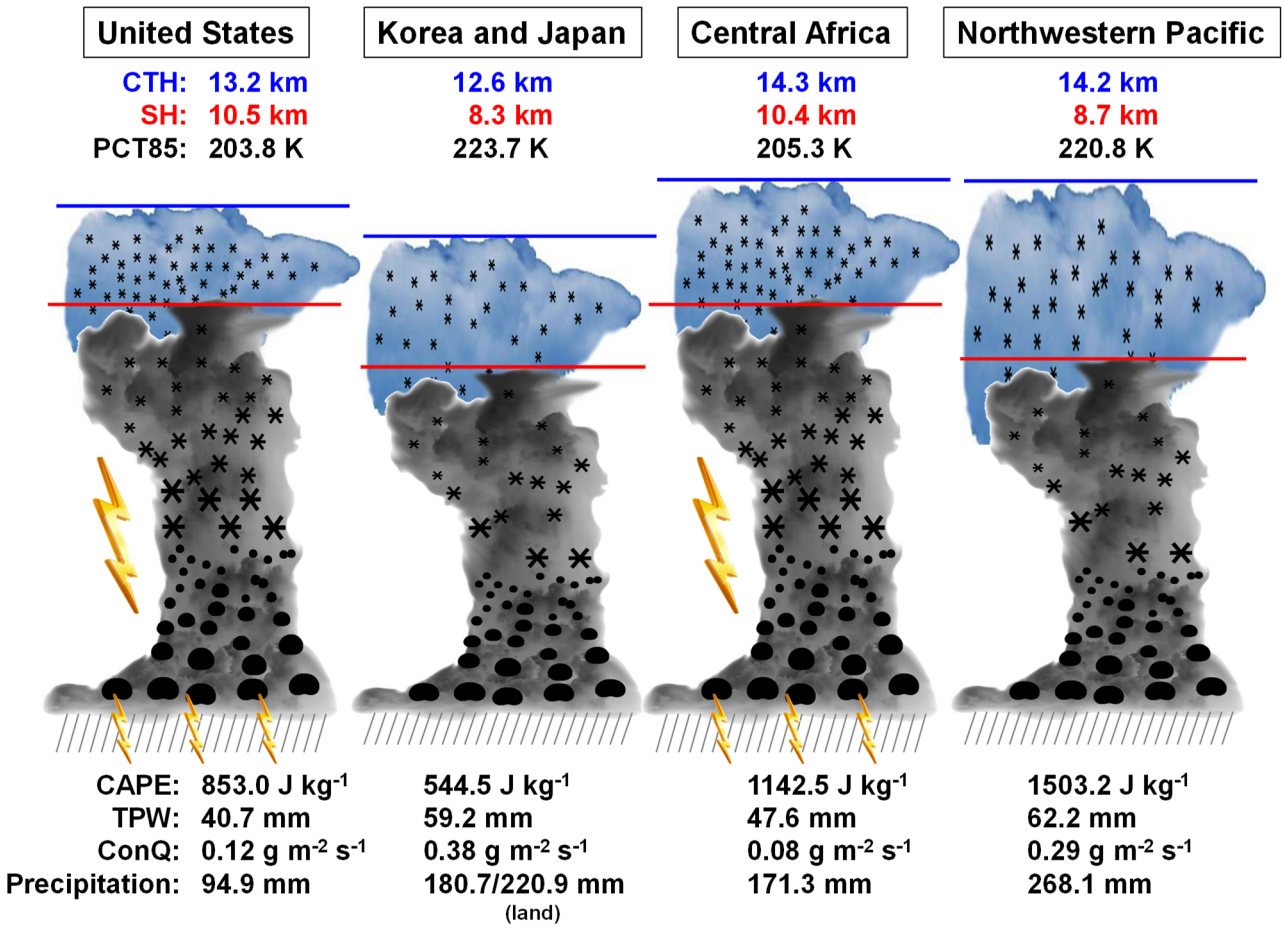

Figure 1. The 12-yr (2002–2013) summer (June-August) mean cloud top height (CTH), storm height (SH), polarization corrected temperature at 85 GHz (PCT85), convective available potential energy (CAPE), total precipitable water (TPW), column-integrated water vapor flux convergence (ConQ), and precipitation for extreme heavy rain clouds (> 40 mm h^{-1}) over four interested areas.

- CTH of heavy rainfall is estimated using VIRS brightness temperature and reanalysis data.
- Continental (oceanic) rainfall regimes are characterized by relatively high (low) SH.
- Heavy rain events with lower CTH/SH in Korea/Japan appear to be very unique in the world.