

## Convective cloud-top vertical velocity estimated from geostationary satellite rapid-scan measurements

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We demonstrate that the development rate of cumulus clouds, as inferred from so-called geostationary satellite "rapid-scan" measurements, is a good proxy for convective cloud-top vertical velocity related to deep convective clouds. Convective cloud-top vertical velocity is estimated from the decreasing rate of infrared brightness temperature observed by the MTSAT-1R satellite over the ocean south of Japan during boreal summer. The frequency distribution of the estimated convective cloud-top vertical velocity at each height is shown to distribute lognormally and is consistent with the statistical characteristics of direct measurements of cumulus updrafts acquired in previous studies. We have commenced a follow-up study using data from a new Japanese geostationary satellite (Himawari-8), which is capable of routine full-disk observations with 10-minute interval and 2-km spatial resolution.

Keywords: cumulus, vertical velocity, geostationary satellite, rapid scan