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Inferring cumulus updraft strength using geostationary satellite rapid-scan measurements

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A statistical analysis is conducted to infer updraft strength (w) of growing convective clouds, using 4-yrs of MTSAT-1R rapid scan observation during summer time over the Far East region. The updraft strength is estimated from depression rate of infrared brightness temperature by comparing successive images with five minute interval.

Estimated w at each height has a statistical distribution similar to log-normal distribution, which the updraft strength observed from direct aircraft measurements follows, demonstrating the efficacy of rapid scan observation for inferring the updraft strength.