



Nowcasting of heavy rainfall using the stability indices obtained from the ground-based microwave radiometer network in Seoul metropolitan area

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Nowcasting of the starting time and peak amount on heavy rain and thunderstorm events is important to reduce the damages due to abruptly developing torrential rain. Stability indices are taken into account to describe a prelude to heavy rainfall. Data are obtained from a ground-based microwave radiometer installed at the Jungnang station in the Seoul metropolitan area during 1 to 3 May 2016. Rain starts at 1700 LST on 2 May, and continues to 2300 LST on 3 May. Stability indices such as the lifted index (LI), convective available potential energy (CAPE), K-index (KI), and brightness temperature at 22 GHz (BT) are considered. It is found that the LI ranges from 2.3 K to 12.8 K on 1 May (non-convective day), while decreases to a value of -5.6 K on 2 May (convective day); the CAPE keeps 0 J kg⁻¹ on 1 May, while increases up to 1,562 J kg⁻¹ at 1630 LST on 2 May; the KI ranges from 15.8 K to 22.9 K on non-convective day, while increases to 30.0 K just before the start of rain, and to 44.9 K after that; the standard deviation of BT is low (0.0 to 1.1 K) on non-convective day, while increases to a value of 7.9 K on convective day. This study gives a great potential to predict heavy rainfall events in advance using the ground-based microwave radiometer installed in the Seoul Metropolitan Area.