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A new technique for rainfall intensity differentiation for MSG SEVIRI

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A new day and night technique for rainfall intensity differentiation using MSG SEVIRI is introduced. It is based on the conceptual model that convective clouds with higher rainfall intensities are characterized by a larger vertical extension and a higher cloud top, whereas for advective-stratiform precipitation areas it is assumed that areas with higher rainfall intensities are characterized by a higher cloud water path (CWP) and more ice particles in the upper cloud regions.
The identification and classification of the convective rainfall areas rely on information about the cloud top height gained from WV-IR differences and the IR cloud top temperature. The subdivision of the advective-stratiform rainfall areas is based on information about the CWP and the particle phase in the upper parts. Suitable channel combinations (VIS0.6, NIR1.6) are incorporated to infer information about the CWP. T8.7-10.8 and T10.8-12.1 are additionally incorporated to gain information about the cloud phase.
Rainfall intensity differentiation is realized by using pixel-based confidences for each subarea calculated as a function of the respective value combinations of the above mentioned variables. For the calculation of the confidences the respective value combinations are compared with ground-based radar data.
A validation of the proposed technique against ground-based radar data shows an encouraging performance.