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- Title and Author Search

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Review

Production

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Evaluation of radiative transfer schemes for mesoscale model data assimilation: a case study

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Abstract. The assimilation of Special Sensor Microwave Imager (SSM/I) data into the Mesoscale Model 5 (MM5) allows for improving the weather forecast. However the results suggested an update the Radiative Transfer Equation (RTE) within the three-dimensional variational (3DVAR) algorithm which is tailored for non rainy conditions only. To this purpose, a new RTE algorithm is tested, in order to account for radiometric response in rainy regions. The new brightness temperatures (T_B) are estimated by using hydrometeor profiles from the MM5 mesoscale model, running with two different microphysical parameterizations. The goodness of the results is assessed by comparing the new T_B with those of the original RTE algorithm in the 3DVAR code and the SSM/I observed data. The results confirm a better reliability of the new RTE compared to the old one.

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