



Contribution of different observation types to data assimilation

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Apart from a realistic representation of atmosphere and land surface by a model a reliable weather prediction requires observations introduced by data assimilation reducing the uncertainty of the model. Since the introduction and maintenance of new observation types for operational data assimilation by weather services as well as the set-up of networks are very expensive, the information content of such new observation types need to be investigated. Especially redundancy and disagreement, which could be caused, among others, by systematic errors in the observation process, with already existing observations need to be determined.

In this work, an approach for an intercomparison of different observation types is presented. Therefore, the specific terms of the cost function representing the observation types were investigated in relation to each other. With help of the existing, well-established WRF 3D-Var the different parts of the cost function were calculated for specific cases within a test region in south-west Germany. Thereby, these terms of the cost function were plotted against each other to estimate the Pareto curve. By investigating the shape of the Pareto curve the information content of the studied observation types could be analysed as a proof of the concept.