

# **ASSIMILATION OF RADIO OCCULTATION DATA AT THE GERMAN WEATHER SERVICE**

D. Pingel\*(1) and A. Rhodin (1)

(1) Deutscher Wetterdienst (DWD), Offenbach, Germany

Radio occultation data, being a valuable source of meteorological information, will be assimilated in the global meteorological forecast model GME of the German Weather Service (DWD). This is accomplished by the algorithm of the three-dimensional variational assimilation system (3D-Var). Bending angles are chosen as the assimilated quantity. To prepare the assimilation and optimize both accuracy and speed of the computation, different versions of forward operators which derive bending angles from the atmospheric temperature and humidity fields are tested: (1) a three-dimensional ray-tracing operator, taking into account the drift of the ray's tangential point in the course of an occultation as well as horizontal gradients of the background fields, (2) three implementations of an one-dimensional operator (based on inverse Abel transformation), that are partially, each to a different degree, able to model the drift of the tangential point. The evaluations are performed based on monthly occultation data sets. Near-real-time radio occultation data from CHAMP, GRACE-A and COSMIC are monitored and the innovation (observation minus background) statistics are compared to the assumed observational and background errors. First analysed data sets are obtained. The analysed bending angles and retrieved profiles of refractivity, temperature, humidity, and geopotential are compared to observations and background (model) data.