

## **Meteorological case studies of the forecast of in-flight icing by ADWICE over the Eastern US for three days**

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Icing of airplanes is a risk factor for air traffic, which makes forecasting of icing regions necessary. The forecast system ADWICE of the German Weather Service uses model data from the weather forecast model COSMO-EU to produce a forecast, where it discriminates between four scenarios about the formation of supercooled liquid water. These scenarios are verified with observed data. From December 1st, 2009, to March 31st, 2010, COSMO-EU and ADWICE were run over the Eastern US. This offers an opportunity to compare the German forecast system with pilot reports (PIREPs), which over the US are ten times more frequent than over Europe. The intention was to compare how ADWICE and COSMO-EU handled different synoptic situations. The data from these model runs together with PIREPs over the same area were used to evaluate the forecast made by ADWICE for three days. On those days different synoptic situations occurred with various mechanisms of the forming of supercooled water. On January 6th, 2010, the type of icing was mostly stratiform. On February 5th, 2010, an extensive area of freezing rain was forecast south of the Great Lakes. On February 15th, 2010, a low pressure system was located over Ohio and caused mostly stratiform icing. For these days surface maps, the forecast from ADWICE for the icing type and intensity, the location of the PIREPs, and observed and forecast soundings for some locations were compared. Where the underlying forecast of COSMO-EU was correct, the forecast of ADWICE was accurate. In general, COSMO-EU identified the weather situation fairly well and, based on that, ADWICE predicted the mechanisms of the formation of supercooled water correctly, though weaknesses occur in the details.