Forecasting Low-Visibility Conditions with Tree-Based Statistical Models

Sebastian J. Dietz (1), Philipp Kneringer (1), Georg J. Mayr (1), and Achim Zeilleis (2)

(1) Institute of Atmospheric Science, University of Innsbruck, Austria (sebastian.dietz@uibk.ac.at), (2) Institute of Statistics, University of Innsbruck, Austria

Low-visibility conditions at airports can lead to capacity problems and therefore to delays or cancelation of arriving and departing aircrafts. To keep the airport's capacity as high as possible, short-term forecasting models with a fast update cycle and a low computation time are needed. In this study, tree-based statistical methods are adapted to high-resolution observation data at airports. Additionally to openly meteorological variables, we use the runaway visual range, as well as remote sensing and ceiling data as input variables. The model's output is an ordered variable with four different low-visibility classes, where classes with very low visibility are rarely. Therefore our investigations present, which observation variables are best for forecasting the low-visibility classes. Further we indicate, which kind of tree model produce best forecast with lead times up to +4h.