# Analysis and nowcast of Available Airspace for ATM

Rudolf Kaltenboeck
Austro Control, Austria

Croonen, G. (AIT Austrian Institute of Technology, Vienna, Austria)
Ganster, H. (JOANNEUM RESEARCH Forschungsgesellschaft mbH, Graz, Austria)
Gärtner, T. (MeteoServe, Innsbruck, Austria)
Hennermann, K. (MeteoServe, Vienna, Austria)
Kerschbaum, M. (Austro Control, Vienna, Austria)
Löscher, G. (MeteoServe, Vienna, Austria)
Mayer, S. (Austro Control, Graz, Austria)
Nowak, C. ((AIT Austrian Institute of Technology, Vienna, Austria)
Steinheimer, M. (Austro Control, Vienna, Austria)
Uray, M. (JOANNEUM RESEARCH Forschungsgesellschaft mbH, Graz, Austria)

*E-mail: rudolf.kaltenboeck@austrocontrol.at*

Deep convection has high impact on flight safety and air traffic management (ATM) efficiency. Particularly organized convection (e.g. squall lines) leads to significant reduction of available airspace for air traffic. In addition, isolated cells located at airports or on approach routes significantly reduce airspace capacity and affect ground handling. Weather is still a non-controllable but predictable component in the European ATM network. Complementary to mandatory aviation warning products yet another deep convection forecast product is operationally provided aiming to support operational decision making and strategic planning of ATM. The horizontal and vertical distribution of deep convection is forecasted for each air space sector as a measure of impact on air traffic capacity.

Due to its high temporal and spatial resolution mainly weather radar data is used for this approach. Three dimensional radar tracking and extrapolation are used to track storm movement, 3D features and development for nowcasting. A combination of these results with other remote sensing data (e.g. lightning, satellite, SAF) and blending to a numerical weather prediction system accomplishes and extends this nowcast to a seamless long range forecast for different scales. Newly developed forecaster intervention tools allow manual modification of the automatic forecasts to improve the results.

The product is designed to provide the relevant meteorological information in an easily and quickly perceivable way to ATM experts without meteorological background for lead times from several minutes up to several days.