Implementing Aircraft Mode-S Data in the Austrian Hydrometeor Classification System

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The Austrian radar network is operated by Austro Control, the civil air service provider in Austria. Therefore, radar sites are located close to major airports, which delivers adequate low level coverage close to large cities and offers the opportunity in using frequently available aircraft data of vertical information of the lower atmosphere close to the ground.

In European designated airspace, the Mode-S EHS (mode select enhanced surveillance) protocol establishes selective positions and addressed interrogations with aircraft within its secondary surveillance radar coverage and provide additional downlinked aircraft parameters from which meteorological information like wind and temperature can be derived.

Different algorithms of hydrometeor classification systems are based on dual-polarization radar measurements, and typical numerical weather prediction model data are used to estimate the type of surface precipitation from radar measurements aloft. The sensitivity of the different presented hydrometeor classification systems in using varied vertical temperature profiles will be demonstrated and the effect in using more frequently available in-situ measurements from Mode-S data to adjust the vertical temperature profiles will be shown for selected case studies e.g. rapid moving frontal systems.

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