



Precipitation and Attenuation Estimates from a High Resolution Weather Radar Network

Felix Ament (1), Marco Clemens (2), Gerhard Peters (1), and Hans Münster (2)

(1) University of Hamburg, Meteorologisches Institut, Germany (felix.ament@zmaw.de), (2) Max-Planck-Institute for Meteorology, Hamburg, Germany

Radar networks to monitor precipitation are usually based on a few expensive, high power and long ranging C-band radars. As an alternative approach, we explore the potential of small, high resolution weather radars (HRWR), which observe precipitation within a range up to 30 km at 60 m and 30 s resolution in space and time. As low cost systems with small antennas, these systems are operated in the X-band frequency range which is affected by attenuation of the radar signal. This apparent drawback can be overcome by operating these systems in a network. In regions, which are covered by more than one radar, it is possible to derive both intrinsic reflectivity and specific attenuation. The relation between specific attenuation and precipitation rate varies less than the commonly used relation between reflectivity and precipitation rate. Specific attenuation as additional observed quantity will likely improve the accuracy of rain rate estimates.

Based on commercial ship navigation radar, we have developed self-made HRWR system. We will present the characteristics and design of this system. In summer 2010, we will deploy a network consisting of three HRWR systems at the Meteorological Observatory Lindenberg close to Berlin. We will discuss the experimental strategy as well as our analysis concept to derive both reflectivity and specific attenuation from networked radar observations.