

A Comparison of Radiosondes and Numerical Weather Prediction Data in the North Sea

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Numerical weather prediction has been used frequently over the past several years to predict radio frequency propagation throughout the world. However, meteorological and radio frequency propagation validation datasets outside of the US coastlines are scarce. Interest in funding extensive meteorological and RF propagation experiments has waned in recent years; as a result, collaboration is necessary in order to continue to expand the validation dataset for this application to different regions of the world.

In September of 2014, a X-band radar experiment was conducted in the North Sea as part of a collaboration between the United States and the Netherlands. Radiosondes were launched from the shore near the radar site as well as from a tug boat approximately 20 km offshore using the NSWCCD controlled leak technique. These soundings will be compared with both the Coupled Ocean / Atmosphere Mesoscale Prediction System (COAMPS), the US Navy's mesoscale numerical weather prediction model (NWP) and the High Resolution Limited Area Model (HiRLAM) Aladin Research on Meso-scale Operational NWP in Euromed (HARMONIE), the Netherlands' mesoscale NWP model, which were run to support the experiment. In order to minimize differences in the model setup, the NWP models were run with 2.5 km horizontal resolution and similar vertical spacing throughout the atmospheric boundary layer.

An overview of the synoptic conditions and weather situation during the event will be provided. Comparisons of the radiosondes to the NWP models will be shown for the basic meteorological quantities. Refractivity statistics and radio frequency propagation comparisons will also be presented comparing the two models to the observations.