GNSS Reflectometry from Orbit: UK-DMC to CYGNSS

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This presentation will give an overview of space based GNSS reflectometry from the first signals received on orbit to preparations for the CYGNSS constellation, scheduled for launch in 2016. The history of the technology from satellite platforms will be presented, starting with the initial reflection ever received from a low Earth orbiting satellite (SIR-C), followed by a summary of the results obtained from the GNSS reflections experiment on the UK-DMC satellite.

Signals received from ocean, land and sea ice by the UK-DMC will be presented, which included successful attempts to estimate the near surface ocean winds to an accuracy of less the 2 m/s RMS. Additional signals were collected by the UK-DMC from sea ice and land and preliminary attempts will be shown to link these signals with surface observables. The signals obtained from the UK-DMC often proved to be very difficult to calibrate and this often made verification of the accuracy of the surface sensing capabilities difficult. This deficiency will be corrected on the next generation of GNSS-R missions, such as the recently selected NASA Earth Ventures 2 mission CYGNSS.

The presentation will conclude with an overview of the planned CYGNSS mission calibration design, which will overcome many of the limitations of the UK-DMC satellite. The more accurately calibrated data generated by the CYGNSS satellites will enable much more accurate measurements of the surface scattered power, which will in turn provide more accurate observations to the scientific community.