Overview of CASPER-West Field Campaign

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The Coupled Air-Sea Processes and EM Ducting Research (CASPER) project is a multi-disciplinary research program designed to fully characterize electromagnetic wave propagation in the marine atmospheric boundary layer, emphasizing on spatial heterogeneities and surface wave/swell effects. The validity of the Monin-Obukhov Similarity Theory (MOST) based evaporation duct models are of particular interests to CASPER.

CASPER includes two major field campaigns. CASPER-East was conducted 9 October- 6 November 2015 offshore of Duck, North Carolina. The emphasis of CASPER-East was on spatial variability and issues related to range-dependent RF propagations for which extensive coordinated measurements from multiple platforms were made over the continental shelf region and over the Gulf Stream region. CASPER-West field campaign is occurring between 27 September and 25 October offshore of Pt. Mugu in S. California with deep water and persistent wave/swell. This presentation will focus on the experiment design and the measurement overview of the CASPER-West field campaign.

The timing of CASPER-West was chosen with the expectation of variable ducting conditions associated with surface swell/waves and capping inversions of the marine atmospheric boundary layer. There are also potentially stable conditions associated with Santa Ana wind events. Major platforms/sites in CASPER include R/P FLIP, an at-sea stabilizing platform, R/V Sally Ride, A Twin Otter research aircraft, the Pt. Mugu shore site, and three moored buoys. Unlike CASPER-East, CASPER West provides continuous monitoring of ducting conditions using fixed location platforms including R/P FLIP, the shore site, and the buoys. Meanwhile, R/V Sally Ride transects along the path where fixed location platforms are deployed. Turbulence and mean wind and thermodynamics measurements are made aboard the R/V Sally Ride and R/P FLIP, complemented by measurements by shore site sounding, tower, and lidar arrays. The involvement of R/P FLIP allows measurements of the marine surface layer in conditions unfavorable for small platforms, an issue we encountered in CASPER-East. Continuous RF measurements are made between the shore site or R/V Sally Ride, or the Twin Otter and R/P FLIP, or between R/V Sally Ride and FLIP or the shore site. Preliminary results from CASPER-West will be presented.