RHEEM LAB.

[Sea Surface Measurement by Active Microwave Remote Sensing]

Department of Mechanical and Biofunctional Systems

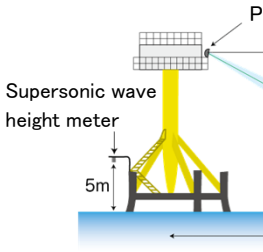
http://seasat.iis.u-tokyo.ac.jp/rheem/

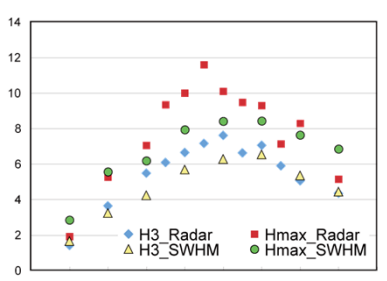
Ocean Environmental Engineering

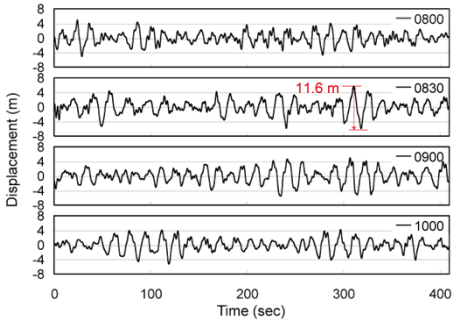
Graduate School of Frontier Sciences, Department of Ocean Technology, Policy, and Environment

Remote Sensing of Sea Surface by using Microwave Pulse Doppler Radar

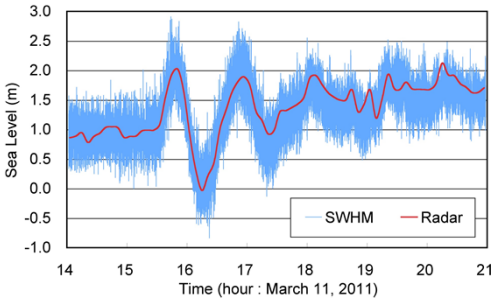
A real-time sea surface wave observation system by using a microwave pulse Doppler radar has been developed. The system measures sea surface waves of multi-measure points simultaneously. Wave direction, period, height and phase of sea surface waves are retrieved. The wave conditions around the measurement site can be predicted in space and time. We have been conducting experiments at off Hiratsuka, Sagami bay.







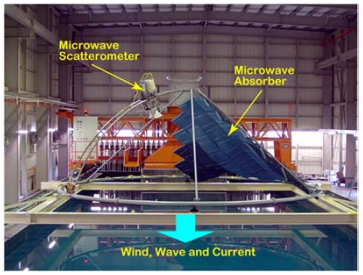
Sea surface waves during 18th typhoon in 2009 measured by pulse Doppler radar



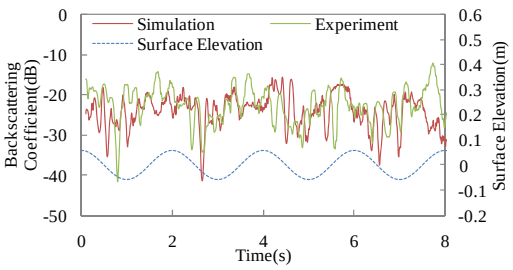
Tsunami on March 11, 2011

Time Domain Numerical Simulation of Microwave Backscattering

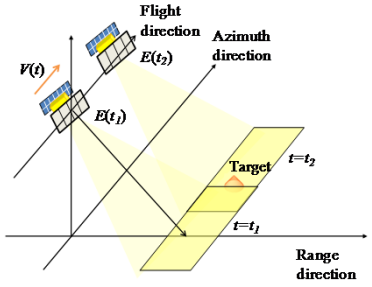
Simulation techniques have been developed to estimate microwave backscattering from the sea surface numerically. The simulation, which can be a substitute of water tank experiments, is applied to evaluate algorithms of sea surface measurements with a Doppler radar and a SAR.



Microwave backscattering measurement system



Microwave backscattering



Ocean SAR image simulation in time domain