[JJ] Evening Poster | A (Atmospheric and Hydrospheric Sciences) | A-TT Technology &Techniques

[A-TT32]Brand-new geoscientific observations by GNSS-Reflectometry

convener:Kaoru Ichikawa(Research Institute for Applied Mechanics, Kyushu University), Kosuke Heki(Department of Earth and Planetary Sciences, Faculty of Science, Hokkaido University)
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GNSS-Reflectometry (GNSS-R) dares to use indirect GNSS signals reflected by an object, which cause multi-path errors in the positioning system, and extracts status information of the reflecting surface itself. It requires low-power and light-weight GNSS receivers alone, so that any platform can be adopted, including microsatellites or UAVs. This session will present various observations using GNSS-R, such as sea surface wind speeds, waves, sea surface height, soil moisture and ice detection.
In addition, possible scientific impacts are discussed with unprecedentedly frequent global observations by multiple satellites, such as NASA's eight-microsatellite CYGNSS GNSS-R mission.

[ATT32-P06]The change of the energy of wind wave under the influence of swells observed by the GPS wave buoy

*Masanori Konda[1], Kunio Kutsuwada[2], Naoya Suzuki[3], Kaoru Ichikawa[4] (1.Department of Geophysics, Graduate School of Science, Kyoto University, 2.Department of Oceanography, Tokai University, 3.Faculty of Science and Engineering, Kindai University, 4.Research Institute for the Applied Mechanics, Kyushu University)
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Wind wave and swells were observed by the GPS wave buoy on the open ocean during the R/V Hakuho-maru cruise in the late winter in 2014 (KH-14-1) in the northwest Pacific. The wave condition included the growing regime as well as the mature one. The wind wave was retrieved from the frequency wave height spectra based on the cut-off frequency along the mean wind direction. A quasi non-dimensional wave energy of the wind waves proposed by Kahma and Calkoen (1992) was investigated to evaluate the influence of swells on the wave growth. The close correlation with the slope of the significant wave of swell component, which was derived as the complement of the wind wave, was remarkable throughout the measurement, whereas the influence of the directional relation between the swell and the wind was also suggested. The change of the friction velocity was also investigated to evaluate how the swell slope influences on the growth of the wind wave. Here we used the friction velocity computed from the Toba’s 3/2 power law rather than that estimated from the bulk formula, as to remove a large ambiguity included in it. With consideration of the relationship between the non-dimensional wind wave energy and the inverse wave age, we obtained a relation between the friction velocity, the along wave wind speed and the wave slope of swells. The deviations of the individual wave records from this relation were significantly smaller than that from the simple relation between the friction velocity and the wind speed. These results showed that the swell can influence on the growth of the wind wave by modifying the wind stress to be transferred into the ocean surface. The energy exchange between swells and wind wave or the suppression of the swells by the counter wind may make a supplemental contribution to the change of the swell slope, through which the wind wave was apparently affected by the directional relation between the swell and the wind.