Ocean-Atmosphere Interaction Studies from Mesoscale to l)asin-Wide Scale Using Spaceborne Scatterometer

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The ocean and the atmosphere are turbulent fluids with non-linear interaction; processes at one scale affect processes at other scales. The large extent of the Pacific Ocean makes it. extremely difficult to monitor ocean-atmosphere exchanges in momentum and kinetic energy at adequate temporal and spatial scales. Spaceborne scatterometer is perhaps the only mean of adequate coverage. Because microwave penetrates clouds, the scatterometer measures wind under both clear and cloudy conditions. While a passive sensor (radiometer) can measure wind speed, an active sensor (scatterometer) measures both speed and direction.

The scatterometer is a valuable sensor to study mcso-scale systems, like mid-latitude storms and hurricanes, because of its high spatial resolution (25 km). The surface wind divergence can be used to improve the estimation of vertical velocity profile, moisture transport and surface hydrologic forcing, particularly in convective areas. The synoptic and large-sca]c coverage afforded by the spacebor ne sensor will help in the monitoring of n ionsoon and Ekman current (wind driven ocean surface circulation). The repeated global coverage of wind vector makes it possible to unravel interannual and basin-wide climate signals, such as El Nino Southern Oscillation. Examples of the application of scatterometer data in all these areas of study will be demonstrated, using ERS- 1 observations. The expected improvement on monitoring global surface wind field by the NASA Scatterometer to be launched on bead of the Japanese spacecraft A)) EOS-1 will also be discussed].