



Observing the Salinity Front in the Western Pacific from Aquarius and OSCAR

Hsun-Ying Kao and Gary Lagerloef

EARTH and SPACE RESEARCH, Kirkland, United States (hkao@esr.org)

The advection of salinity front near the eastern edge of Pacific warm pool is known to be important to the formation of barrier layer, which can influence ocean dynamics during the onset phase of ENSO events by maintaining the heat buildup in the western Pacific. More than 16 months of sea surface salinity (SSS) measurements obtained from the Aquarius satellite are available since late August 2011. The high spatial and temporal resolution salinity maps provide the clear identification for the location of the salinity front in the western Pacific for the first time. Together with zonal currents from Ocean Surface Current Analyses Real-Time product (OSCAR), we are able to calculate the advection of the salinity front, which is important for three purposes: First, the advection of the salinity front can help building up the barrier layer which can further change the behavior of ENSO. Second, the east-west migration of the salinity front corresponds to the ENSO activities. For example, during the 2011 La Nina, the salinity front advects westward and results in much higher SSS in the western Pacific compared to the neutral year in 2012. Third, we can analyze how the ocean compensates for the large net freshwater flux into the warm pool region using simple salt budget analysis. High consistency is observed between Aquarius SSS and OSCAR currents, indicating that the small scale eddies and tropical waves are captured independently from different satellite measurements. The preliminary results from the salt budget show that the surface currents plays an important role advecting the location of salinity front, and the continuous precipitation under the ITCZ region keeps the low salinity in the western side of the salinity front to sustain the strong salinity gradient. The results demonstrate the important value of Aquarius in studying the role of salinity in regulating ENSO activities.