



## **Effect of La Nina on the global mean sea level and north Pacific ocean mass over 2005-2011**

Habib B. Dieng (1), Anny Cazenave (1), Benoit Meyssignac (1), Olivier Henry (1), Karina von Schuckmann (2), Hindumathi Palanisamy (1), and Jean Michel Lemoine (3)

(1) LEGOS, Toulouse, France (habib.dieng@legos.obs-mip.fr), (2) Mediterranean Institute of Oceanography, La Grade, France, (3) CNES-GRGS, Toulouse, France

Interannual fluctuations of the global mean sea level are highly correlated with El Nino-Southern Oscillation (ENSO) events, with positive/negative anomalies during El Nino/La Nina. In a previous study we showed that during the 1997-1998 El Nino, a positive anomaly observed in the global mean sea level was mostly caused by an increase of the ocean mass component rather than by steric (thermal) effects. This result was related to an increase of precipitation over the tropical ocean and a deficit in land water storage. In the present study, we investigate the effect of the recent 2008 and 2011 La Nina events on the satellite altimetry-based global mean sea level. We find that the large global mean sea level drop associated with the 2011 La Nina results from the combined decrease of the steric and ocean mass components, with a slightly dominant contribution from the latter. We show that the ocean mass contribution to the global mean sea level drop is spatially confined over the north eastern tropical Pacific (just as was found previously for the 1997-1998 El Nino, but with opposite sign). Corresponding ocean mass spatial pattern is closely correlated to observed sea level and steric spatial patterns over the duration of the La Nina event. This is also observed for previous El Nino and La Nina events. Such a drop in ocean mass during ENSO in the eastern part of the tropical Pacific has not been reported before. It is possibly related to a temporary decrease in the net precipitation over the north eastern Pacific (opposite situation was found during the 1997-1998 El Nino).