Japan Geoscience Union Meeting 2012
(May 20-25 2012 at Makuhari, Chiba, Japan)


AAS23-P03 Room:Convention Hall Time:May 22 17:15-18:30

# Mechanism for the asymmetry in ENSO transition and duration

OHBA, Masamichi[1*]

[1]Central Research Institute of EPI

The El Nino-Southern Oscillation (ENSO), which consists of a quasi-periodic (3-7-yr timescale) warming (El Nino) and cooling (La Nina) of the tropical central and eastern Pacific Ocean (CEP), is the most dominant driver for Earth interannual climate variability. ENSO prediction is of practical interests, in addition to scientific, because of its large environmental and societal impacts. To predict and understand the variability of ENSO, a number of investigators have suggested conceptual theories, providing a comprehensive idea regarding the cyclic nature of ENSO. The mechanisms in these conceptual theories effectively capture the observed phase transition from El Nino to La Nina and successfully reproduce the linear oscillation of ENSO. However, several studies have reported that a type of break in the ENSO cycle occurs when La Nina shifts to El Nino. The air-sea coupled system over the Pacific somehow remains in a weak La Nina state for up to two years, while El Nino tends to turn rapidly into La Nina after the mature phase. Recent studies (Ohba and Ueda 2009; Ohba et al. 2010; Okumura et al. 2011) have reported that the nonlinear atmospheric response to the CEP sea surface temperature forcing is a fundamental cause of the asymmetry in the transition. Because the duration of an ENSO episode can cause severe drought, for example, the 1999-2001 drought in central Asia from, and this duration is difficult to reproduce in most coupled general circulation models, understanding of the ENSO asymmetry is important for improving seasonal climate forecast skills (Ohba et al. 2010; Ohba and Watanabe 2012). Therefore, the asymmetry of transition/duration is an important aspect of ENSO. In the presentation, these recent studies will be introduced with the discussion of its long-term change and asymmetry in the ENSO predictability.

Keywords: El Nino/Southern Oscillation, Indian Ocean, Pacific Ocean, Sea surface temperature