Dynamics of the Intraseasonal Variability in the Coastal Waveguide of the North Indian Ocean

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The winds over the North Indian Ocean (NIO) exhibit significant variability at intraseasonal timescales, in particular associated with the Madden-Julian Oscillation (MJO). Vialard et al. [2009] studied the response of sea level and currents in the coastal waveguide of the NIO to this intraseasonal wind variability. Using a combination of sea level, winds and current measurements, Vialard et al. [2009] showed that there was a clear dynamical response of the Northern Indian Ocean to MJO forcing, with signals propagating from the equatorial waveguide into the coastal waveguide of the NIO (around the Bay of Bengal; along the west coast of India). In addition they showed that this intraseasonal dynamical response tends to dominate the alongshore current variability along the west coast of India. However, there are issues that need further investigation, like – for example – the exact path of the intraseasonal signal propagation in the NIO coastal waveguide.

In this talk, we describe the intraseasonal variability in the coastal wave guide of the NIO more precisely with the help of observations and simulations using a high-resolution Ocean General Circulation Model of the Indian Ocean. We aim to identify the dominant timescales more precisely and understand the vertical structure of this intraseasonal variability. We will also ascertain the relative contributions of local and remote forcing to the intraseasonal variability, e.g. is the variability along the west coast of India mostly influenced by local winds or is there a significant contribution coming from the Bay of Bengal or equatorial waveguide?

Keywords: Intraseasonal variability, Madden-Julian oscillation, Northern Indian Ocean, Kelvin and Rossby waves

References

[1] J. Vialard et al., Geophys. Res. Lett. 36 (2009)