Evaluation of Air-Sea Flux Products over the Indian Ocean

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Proper knowledge of air-sea flux variability is an indispensable pre-requisite for the successful understanding of ocean-atmosphere interactions. Many recent studies have underlined that the Indian Ocean is more climatically active than once thought, with strong regional and global climate impacts associated to modes of variability like the Madden-Julian Oscillation (MJO), Indian Ocean Dipole (IOD) or remotely forced response to El Niño-Southern oscillation (ENSO). It hence seems necessary to evaluate air-sea flux products thoroughly over the Indian Ocean. The quick development of the moored RAMA array (McPhaden et al, 2009) in the tropical Indian Ocean now provides a quality database against which various air-sea flux products can be evaluated. In this talk, we will compare various flux products over the Indian Ocean to RAMA-derived air-sea fluxes. These products include namely the ERA-interim (ERA-I, Dee and Uppala, 2009), NCEP (Kalnay et al. 1996) and NCEP2 (Kanamitsu et al. 2002) re-analyses, OAFlux, as well as a newly developed product named TropFlux. TropFlux provides daily, timely estimates of air-sea fluxes, largely derived from ERA-I with some bias corrections. Comparison of TropFlux with mooring fluxes shows a better performance than the existing products like NCEP, NCEP2, ERA-interim and similar performance to the OAFlux product. We then produce composite anomalies of surface air-sea flux perturbations associated with the main modes of intraseasonal and interannual variability over the Indian Ocean (namely the MJO, IOD and remotely induced ENSO perturbations) from the various fluxes to illustrate uncertainties in the knowledge of air-sea interactions over the Indian Ocean

References

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