7.12 IMPACT OF IMPROVED WIND FIELDS ON OCEAN-ATMOPSHERE HEAT FLUXES IN THE TROPICAL PACIFIC

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We examine the impact of using improved wind fields (from the NASA scatterometer QuikSCAT) on estimates of the sensible and latent heat fluxes determined both from bulk formulae [*Fairall et al.*, 1996] and from an advective atmospheric boundary layer model developped by *Seager et al.* [1995]. The assessment of the effect of scatterometer winds is provided by comparisons with heat fluxes produced by the National Center for Environmental Predictions (NCEP) AGCM and by running the NCEP winds through the same algorithms.

Significant differences are expected for at least two reasons. First, the increased spatial resolution of the scatterometer winds results in a more accurate representation of important features such as the intertropical convergence zone (ITCZ). Also, scatterometer winds differ from model wind products from the fact that they are intrinsically measured relative to ocean currents. This effect turns out to be substantial in the tropics where winds are relatively low and steady (Kelly et al., manuscript submitted to Geophysical Research Letters, 2000), which suggests that it might also be significant in terms of how we estimate air-sea thermal exchanges.

Discrepancies in the different estimates of the heat fluxes may have important implications for the modeling of upper ocean thermodynamics and circulation, some of which are examined.

References

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Seager, R., M. B. Blumenthal, and Y. Kushnir, An advective atmospheric mixed layer model for ocean modeling purposes: global simulation of surface heat fluxes, *J. Climate*, *8*, 1951–1964, 1995.

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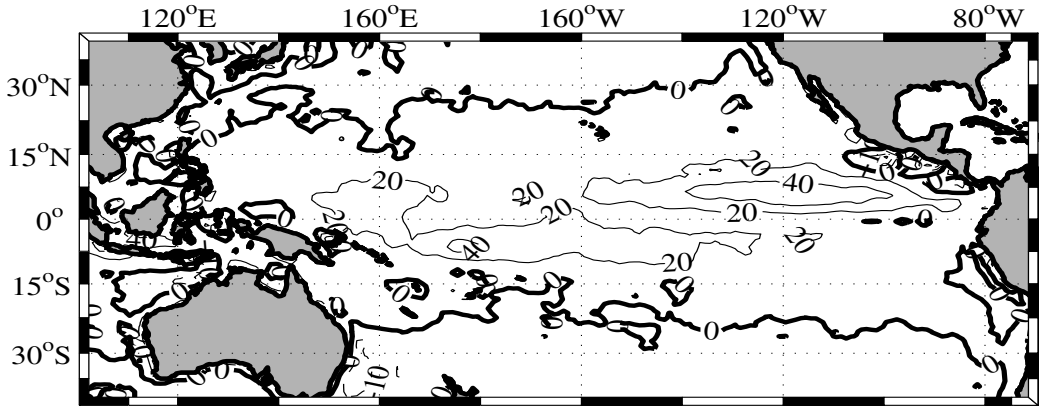

Figure 1: Difference in the annual mean latent heat flux computed with QSCAT winds, and NCEP winds, respectively. The two estimates use the same parameterization (Fairall et al, 1996), and differ only by the wind product. Units are $W\ m^{-2}$.