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SEASONAL VARIATIONS OF MASS AND HEAT IN THE INDIAN OCEAN ESTIMATED FROM A REDUCED GRAVITY THERMODYNAMIC MODEL AND FROM OBSERVATIONS.

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A 2 and 1/2-layer model forced by climatological fluxes is run to simulate the physics of the upper Indian Ocean. Observations (hydrographic profiles over 1980-1995 derived from Smith, 1995) provide climatological data sets which are used for comparison and analysis of the model simulations. The change rate of heat content in the upper ocean over 400m compares well in amplitude and phase with the simulated one. The largest discrepancies show up on the eastern side of the equator, with changes of 200W/m2 for the data and 50W/m2 for the model, and in the western region, at the center of the cyclonic gyre south of the equator (50W/m2 and 200W/m2, respectively). Averaged zonally, the meridional heat transport calculated from hydrographic data and from the model air-sea fluxes agrees to some extent with the simulated one. The phase is particularly well reproduced by the model. Between May and October, the model simulates a southward cross equatorial heat transport of 1.3 PetaWatts (PW), and during the rest of the year, the northern ocean replenishes its heat content at a rate of 0.9 PW. The corresponding figures for the observed estimates are 0.9PW and 0.5PW respectively. The possibility that the model data discrepancies be due to data errors is being examined with the TOPEX sea level 4 year data set and the FSU air-sea flux climatology.

Submittal Information

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2. The low-latitude oceans.
3. Prof. Dr. Friedrich Schott
4. none
5. Oral presentation strongly preferred