Advection and diffusion of Indonesian Throughflow within the Indian Ocean South Equatorial Current.

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The Indian Ocean South Equatorial Current forms the boundary between the highly seasonal, monsoon circulation of the northern Indian Ocean and the more typical subtropical gyre regime of the southern Indian Ocean. What particularly sets the Indian Ocean Southern Equatorial Current apart from its cousins of other oceans in the presence of low salinity Pacific water injected at the eastern side of the ocean, the Indonesian Throughflow. The WOCE Indian Ocean WHP lines offers a near synoptic view of the advection and diffusion of the Indonesian Throughflow water as its spreads across the Indian Ocean near 12W, limited for the most part o the upper 300 m using the CTD/Rosette data (temperature, salinity, NO and PO, the "preformed" nutrient concentrations) and hull mounted ADCP data, the transport of the throughflow water can be determined, as well as its isopycnal mixing with the adjacent Indian ocean water. The percentage of Indonesian water within the South Equatorial Current is determined by comparison of the Indonesian source water found within the Timor Sea based on the Arlindo data of 1994, and principal water types of the Indian Ocean observed during the WOCE WHP observational period of 1995. The velocity field is determined using the ADCP velocity perpendicular to the WHP section, averaged between stations, at 200 m (below the Ekman layer) for geostrophic reference. As the injection of the Indonesian Throughflow water is highly season a smooth zonal trend of its contribution to each section is not expected. The WHP repeat lines help decipher the seasonal signal. {Typical transport of Indonesian Throughflow water across the three meridional sections (I7,8,9) is 8 to 10 Sv. Attenuation of the low salinity signal of the throughflow water requires an isopycnal mixing coefficient of around 4×10^3 m^2/s, that some may consider as a large number.