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The South East Madagascar Current and undercurrent

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In 2001, one of the sources for the Agulhas Current, i.e. the South East Madagascar Current (SEMC), was surveyed with four sections almost perpendicular to the flow, as part of the ACSEX programme. The first section, T5, was located south of Madagascar along 45°E. The last section, T8, along 25°S east of Madagascar repeated an earlier section, I4E, measured during WOCE in 1995. Combined hydrographic and LADCP profiles were collected to a maximum depth of about 2400 m. The average transport by the SEMC obtained from the direct velocity measurements was 36 Sv in the South- to Southwestward direction. At intermediate depths an undercurrent was observed flowing in a direction opposite to the overlying SEMC. The velocity in the core of the undercurrent was relatively high, between 15 and 31 cm s^{-1}. The averaged transport in the undercurrent was nearly 3 Sv. On each section, at one station a high salinity water mass with low dissolved oxygen and high nutrient concentrations was observed at intermediate depths, apparently influenced by Red Sea Water (RSW). These stations were located nearest to the continental slope with a bottom depth in or below the intermediate layer. Part of this RSW containing water mass was transported North- Northeastward by the undercurrent. The older hydrographic and LADCP data of WOCE section I4E showed that presence of an undercurrent and a RSW containing water mass near the continental slope are at least recurrent features.