

Temporal and spatial variability of the ACC, fronts and eddies in the Indian Sector of the Southern Ocean derived from satellite radar altimetry

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In the Southern Ocean, the Antarctic Circumpolar Current (ACC) and fronts (e.g., Polar front) have been detected by using in-situ data, satellite data and numerical simulation (e.g., Gille, 1994; Belkin and Gordon, 1996; Feng et al. 2013). Except for numerical simulation, it is difficult to obtain temporal evolution of the ACC and fronts. In this study, the temporal and spatial variability of large-scale features such as the ACC and fronts are extracted from merged absolute dynamic topography (MADT) distributed by CNES/AVISO. To decompose MADT into those features, 2-D FFT and inverse FFT were applied. Results clearly show temporal variability of meandering of the ACC and fronts, and geostrophic velocity field in relation to the ACC variability. Using our method, mesoscale features without long-term trend was also derived, while the AVISO Sea level anomaly contains long-term and nonlinear trend.

Keywords: satellite radar altimetry, Antarctic circumpolar current, mesoscale eddy