



Tropical rings

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Oceanic rings and eddies influence the global-scale environment by transporting anomalous physical and biological properties over large distances and between ocean basins, by causing enhanced stirring and mixing, and by influencing the physical and biogeochemical fluxes between the ocean and atmosphere. A preponderance of the world's western boundary currents generate discrete, translating rings from pinched-off current meanders. In some current systems (e.g. the Gulf Stream, Kuroshio, Agulhas) rings form in the open ocean and may translate for thousands of kilometers before dissipating. Elsewhere ring formation and translation are topographically constrained and individual features may survive for only a few months (e.g. Gulf of Mexico Loop Current, North Brazil Current). Compared to a rich literature on subtropical rings, documentation of ring generation by the low-latitude western boundary currents is relatively sparse. In this presentation we compare and contrast recent in-situ and remote observations of mesoscale ring generation in the western low-latitude Atlantic and Indian Oceans. In particular, we review recent observations of North Brazil Current ring translation and evolution along the northeast coast of South America, and present new measurements indicating that a portion of the Somali Current accelerates northward through the Socotra Passage and, constrained by the Arabian Peninsula, retroflects sharply and occasionally collapses upon itself to form discrete anticyclonic current rings which translate westward into the Gulf of Aden. Although the basic physical characteristics of these tropical rings are remarkably similar their interactions with the general circulation and regional topography differ substantially.