"Oxygen Minimum Zones in the Northern Indian Ocean"

Abstract: In the tropics, mid-depth oxygen minimum zones (OMZs) are located in poorly ventilated regions below the thermocline. As a result, surface production can contribute to the strength of OMZs remotely as well as locally. In the northern Indian Ocean, OMZs can be found in the Arabian Sea (ASOMZ) and the Bay of Bengal (BBOMZ), consistent with the distribution pattern of ventilation ages. The intensity of the BBOMZ is moderate, while permanent suboxic condition (O₂ < ~5 μM) is reached in the Arabian Sea, clearly due in part to local production.

The ASOMZ is the second most intense OMZ in the tropical ocean, with near-total depletion of oxygen at depths from 200-1000 m. The lower part of the ASOMZ (below 400 m) indicates a northward intensification, in agreement with the ventilation age revealed by CFC ratio. The upper part of the ASOMZ (above 400 m), however, appears east of the most productive regions along the western boundary, and there is no consensus about what causes this “eastward shift.” In contrast, much less is known about the distribution of BBOMZ. In both sub-basins, the relative roles of physical versus biological processes in generating OMZs have not been fully determined, in part because ocean models often fail to reproduce these OMZs. In this seminar, the speaker will present the latest results of their findings.

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