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# The role of internal waves in the circulation of the Southern Ocean

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## Abstract

The meridional overturning circulation and stratification of the global ocean are shaped critically by processes in the Southern Ocean. This influence is exerted via a set of special dynamics that couple the eastward flow of the Antarctic Circumpolar Current (ACC) with the meridional overturning circulation across the Southern Ocean. Efforts to unravel the dynamics of this coupling have to date emphasised the large-scale circulation's control by wind and buoyancy forcings and by mesoscale eddies generated by baroclinic and barotropic instabilities of the ACC. In this talk, I will review recent evidence from a major UK – US observational programme (the Diapycnal and Isopycnal Mixing Experiment in the Southern Ocean, DIMES) pointing to a significant role of internal waves in the zonal and meridional circulations of the Southern Ocean. I will show that the impingement of mesoscale flows onto rough seafloor topography generates internal waves that contribute significantly to dissipating the regional eddy field, arresting ACC jets, and mixing and upwelling water masses across density surfaces.

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