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Observing Microstructure with Seagliders

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In recent years the UEA glider group worked with Kongsberg Maritime and Rockland Scientific Inc. (RSI) to develop and test an integrated microstructure system which could be mounted on Seagliders. Existing RSI microstructure packages such as the MicroRider could not be used on Seagliders because of a geometry mismatch with the shape of the Seaglider's hull that made mounting difficult, and because the size of those packages added an unacceptable drag. We also required a more sophisticated software interface so that the RSI system could be controlled by the standard Seaglider scientific logger payload control software.

Since the initial sea trials in 2015, microstructure Seagliders have been deployed on missions in the Bay of Bengal, the Faroe Shetland Channel, east of the Bahamas, and the Weddell Sea. Early successes were followed by a number of technical problems which have now been resolved. Improvements in the glider flight model have led to improvements in microstructure estimates. The most recent deployment in the Weddell Sea allowed comparison between Seaglider estimates of dissipation and those from an established microstructure profiler (MSS90). Dissipation estimates measured by the Seaglider system varied between 10^{-10} and 10^{-5} W kg⁻¹, with higher values generally closer to the surface. Those observed by the MSS were similar at depth but slightly higher in the top 200 m. Further work will aim to understand these differences.