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## A Deep Water Dispersion Experiment in the Gulf of Mexico

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The Deep Water Horizon oil spill has dramatically impacted the Gulf of Mexico from the seafloor to the surface. While dispersion of contaminants at the surface has been extensively studied, little is known about deep water dispersion properties. This study describes the results of the Deep Water Dispersion Experiment (DWDE), which consisted in the release of surface drifters and RAFOS floats drifting at 300 and 1500 dbar in the Gulf of Mexico. We show that surface diffusivity is elevated, and decreases with depth. The separation dependence of relative diffusivity follows a Richardson law at all depths. Time dependence of dispersion suggests a Richardson regime near the surface and a mixed Richardson/ballistic regime in depth at scales of [10-100 km]. Finite Scale Lyapunov Exponents and pair separation Kurtosis suggest the existence of a Lundgren regime at scales smaller than the Rossby radius near the surface, and at smaller scales in depth.