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Glider based turbulence observations in Gulf of Mexico

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Turbulence kinetic energy (TKE) dissipation rates calculated from glider-based microstructure shear and temperature observations were used to validate epsilon estimates derived from Thorpe Length scale parametrizations. In general Thorpe based TKE dissipation rate calculations showed good agreement in pattern structures with direct microstructure measurements. Due to the scarcity of microstructure observations the validated Thorpe length scale parametrization can be applied to existing glider CTD data from multiple missions in different regions of the Gulf of Mexico (GOM) in order to analyze mixing patterns. Using this approach, we will present TKE dissipation rate observations made during the last 3 years (2015-2017) in the GOM by scientists of Texas A&M University. Twelve glider deployments were carried out, two of which with microstructure sensors and 10 deployments without. The main focus areas of these observations targeted the Loop Current and Loop Current anticyclonic eddies during missions lasting between 7 and 80 days plus several shallow water missions in the Northern GOM. In addition to turbulent mixing the gliders collected hydrographic data (CTD), as well as chlorophyll, chromophoric dissolved organic matter (CDOM) and dissolved oxygen measurements. Initial results indicate that Thorpe scale based estimations identified higher mixing along the deeper thermocline within eddies and loop current; higher mixing was also found in surface mixed layer, while deep ocean and the interior of eddies represent quiescent regions.