Impacts of convergence on structure functions from surface drifters in the Gulf of Mexico

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Lagrangian instruments are frequently deployed as a low cost way to obtain statistics about the kinetic energy spectrum. Structure functions are well suited for dealing with the unevenly sampled spatial data they produce, and can unveil the complexities of oceanic processes across many scales. Visual inspection of drifter trajectories from the GLAD and LASER drifter deployments reveal that drifters often get caught in oceanic features, such as eddies and fronts, preventing them from effectively sampling the entire velocity field. Additionally, *Poje et al 2014* identifies from the GLAD data that the submesoscales produce significant local dispersion (a similar statistic to the structure function), and that this dispersion statistic is not representative of those obtained from the velocity fields of operational ocean models. This study presents results quantifying the effect of model resolution, as well as the Eulerian-Lagrangian distinction, to account for discrepancies between observations and model output. This is accomplished by contrasting structure functions obtained from simulated Lagrangian trajectories against those calculated from the Eulerian model grid of the climatologically forced Regional Ocean Modeling System at both 150m and 500m resolutions. Structure functions of the divergence and curl of the velocity field are found to diagnose the influence of these "trapping" features in biasing the Lagrangian structure function.