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Ocean Freshwater Lenses: Prevalence and Persistence

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During the Salinity Processes in the Upper Ocean Regional Study II (SPURS-II), a novel dataset was collected from an underway system sampling seawater at the surface, 2m, 3m and 5m. The surface measurements are performed using a boom-mounted suction hose and a peristaltic pump, as well as a shipboard apparatus with multiple de-bubbling stages. The data collected during this cruise reveal approximately fifty freshwater lenses in the Intertropical Convergence Zone (ITCZ), sampled between August 15 and September 20 under several different wind- and precipitation-regimes. Preliminary analysis shows that that the persistence of oceanic freshwater lenses is strongly dependent on the evolution of wind speed as well as the total amount of precipitated water.
The results are analyzed in a number of case studies of different types of freshwater lenses, in which the balance between precipitation and wind-driven mixing is elucidated. While the limited sample size restricts the validity of the findings to the SPURS-II region, centered around 125°W, 10°N, during the late boreal summer of 2016, it has important consequences for modelling of freshwater lenses and their impact on satellite retrievals of salinity.