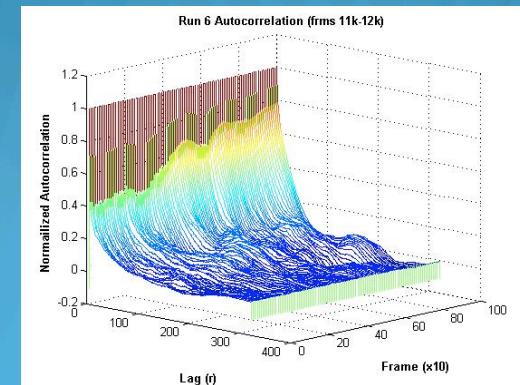
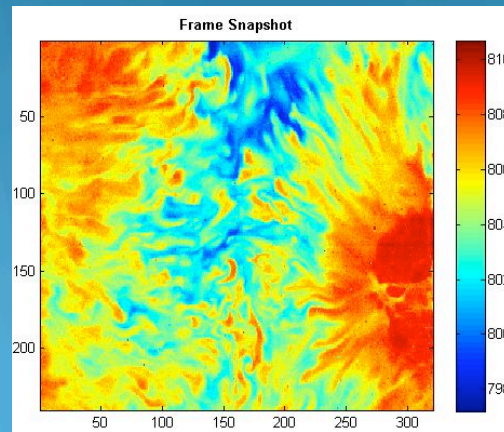
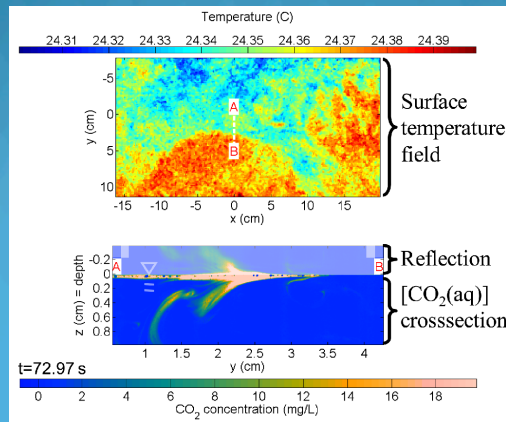


“Simultaneous Direct Heat and Carbon Dioxide Flux at a Turbulence Free Surface”



Purpose: The purpose of this experiment is to fully quantify and evaluate heat and gas transfers under turbulent conditions, as well as increase understanding of the interaction between the atmosphere and bulk water at their boundary surfaces.

Methods: Since surface water temperatures are slightly cooler than bulk water temperatures, the infrared camera employed allows one to locate the boils and upwelling events based on the minute temperature fluctuation they produce at the surface. From this one can measure the size, intensity, duration, and motion of such boils, determine the heat flux that occurs, and eventually compare such measurements to the intensity of CO₂ injections taking place directly below the surface in that area.

Results: Since the same turbulence that causes the concentrated boundary layer to be swept away into the bulk, simultaneously brings warmer bulk water to the surface, we can identify periods of heavy turbulent mixing through autocorrelation analysis and its corresponding integral length scales.