

In-Water Mass Spectrometry for Characterization of Light Hydrocarbon Seeps and Leaks

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The oil and gas industry, and organizations that environmentally monitor deep ocean and coastal regions, have a need to detect and characterize light hydrocarbons in these regions. Hydrocarbons can enter the water column through natural seepage from the sea floor, or through unintended leaks and spills from drilling operations and transportation of oil and gas to shore. The ability to perform this analysis in situ greatly enhances achievable spatial and temporal densities. In addition, real-time, in-water chemical measurements allow for rapid decision-making, provide adaptive sampling strategies, and offer the possibility of tracking chemical gradients to trace leaking chemicals to their source. SRI International's in situ membrane introduction mass spectrometry (MIMS) instruments can quantitatively detect light hydrocarbons in water at trace levels, while simultaneously monitoring the concentrations of all light, stable dissolved gases to a depth of 2000 meters.

We will discuss the design and operational parameters of our new in situ MIMS instrument, which is deployable on underwater platforms, such as the Bluefin BF-12 autonomous underwater vehicle (AUV). We will also present results from recent AUV deployments of our MIMS systems to characterize hydrocarbon seeps and other features in the Tampa Bay, FL and the Santa Barbara Channel, CA.