ELVIDOR- Vibrating Gold micro-wire Electrode: *In situ* high resolution measurements of Copper in marine environments

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In situ chemical sensors clearly represent the future of ocean observation, especially in chemical oceanography and trace metal chemistry. These instruments help to resolve the low-resolution encountered by more traditional oceanographic approaches. *In situ* measurements are also very useful to obtain information about the seawater composition, specifically in hydrothermal waters, as these environments are characterized by a high spatiotemporal variability. Hydrothermal activity at mid ocean ridges are now considered to be a significant source of many elements to the ocean, including trace metals, with plumes extending for thousands of km away from the vent source [1,2]. The trace metal copper (Cu) is a required element to most phytoplankton processes as it is an important component of respiratory proteins and oxidases but can also become toxic at relatively low concentrations.

Here we present the development of an *in situ* Cu microsensor, which uses anodic stripping voltammetry with a vibrating gold microwire working electrode, a Iridium wire counter electrode and a solid state reference electrode made of AgCl coated with a immobilized electrolyte and protected with Nafion [3]. This sensor will be able to detect Cu in seawater at nanomolar concentrations and also has the ability to perform speciation measurements. The current lab version of the system allows for low nM resolution (2 ± 0.5nM) measurements on coastal waters. Potential applications of the *in situ* system will be to trace hydrothermal plumes [4].

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