Geophysical Research Abstracts
Vol. 17, EGU2015-5270, 2015
EGU General Assembly 2015

Long term in situ monitoring of total dissolved iron concentrations on the MoMAR observatory

Agathe Laes-Huon, Julien Legrand, Virginie Tanguy, Cecile Cathalot, Jérôme Blandin, Jean-Francois Rolin, and Pierre-Marie Sarradin

Ifremer, Centre de Brest, Département Ressources physiques et Ecosystèmes de fond de Mer, BP 70, 29280 Plouzané, France (agathe.laes@ifremer.fr)

Nowadays the scientific community wants relevant monitoring with an increase in spatial and temporal distribution of key chemicals. The hydrothermal ecosystems characterized by strong physico-chemical gradients are also of particular interest as they present an unique fauna, sustained by microbial chemosynthesis. The characterization of the chemical environment in the hydrothermal vent ecosystems implies the use of in situ instrumentation which is a serious challenge in the marine environment (Prien et al. 2007). The CHEMINI (CHEmical MINIaturised analyser), presented here, is a chemical in situ analyser specialized for deep sea uses (Vuillemin et al. 2007). It was first deployed on the autonomous deep sea observatory MoMAR (Monitoring of the Mid-Atlantic Ridge, $FIXO_3$, Fixed point Open Ocean Observatories) in 2010. The first part of the presentation will focus on the description of the CHEMINI, then on the results obtained on the MoMAR observatory during the last 4 years. CHEMINI, implemented on the TEMPO ecological module determined total dissolved iron concentrations associated with an optode and a temperature probe. Several months of total iron concentrations, of T°C and videos were recorded permitting the study of the temporal dynamics of faunal assemblages and their habitat on the Lucky strike vent (-1700m, Cuvelier et al. 2011). Long term in situ analysis of total dissolved iron (31st of August 2013 - 23rd of February 2014, [DFe] = 7.12 +- 2.11 μmol L-1, n = 519) at the Eiffel Tower edifice is presented in details. The daily analyzed in situ standard (25μmol.L-1) showed an excellent reproducibility (1.07%, n=522). CHEMINI was reliable, robust over time for in situ analysis. The averaged total dissolved iron concentrations for the 6 months period remain low but they correlated significantly with temperature showing a spectra frequency with a maximal contribution around 4-5 days for both variables. The analytical results will be commented and the future technical challenges will be discussed in this presentation.

References:

Cuvelier, D, Sarrazin,J, Colaco A. Copley J.T., Glover A.G. Paul, A. Tyler, Serrao Santos R., Desbruyères D. (2011), Community dynamics over 14 years at the Eiffel Tower hydrothermal edifice on the Mid-Atlantic Ridge, Limnol. Oceanogr., 56(5), 1624–1640

Prien, R. (2007), The future of chemical in situ sensors, Mar. Chem., 107 (3), 422-432.

Vuillemin, R., Le Roux, D., Dorval, P., Bucas, K., Sudreau, J.P., Hamon, M., Le Gall, C., Sarradin, P.M., 2009. CHEMINI: A new in situ CHEmical MINIaturized analyzer. Deep Sea Res. Part Oceanogr. Res. Pap. 56, 1391–1399.