A preliminary study on the water column distribution of CH_4 and N_2O off the east coast of Korean Peninsula South of Donghae in summer 2009

Kyung-Ah Park[1], Tae Siek Rhee[1], Gangwoong Lee[2], Dong Seon Kim[3], and Hyung Chul Shin[1]

[1]Korea Polar Research Institute, [2] Department of Environmental Science, Hankuk University of Foreign Studies, [3] Korea Ocean Research & Development Institute

Keyword : CH_4, N_2O, Donghae

Methane (CH_4) and nitrous oxide (N_2O) are important greenhouse gases. Their global warming potentials are about 20 times and 300 times larger than CO_2 on a 100-year horizon, respectively. The ocean plays a minor or substantial role in emissions of CH_4 and N_2O to the atmosphere. Since these gases are produced by microbial activities under anoxic or suboxic conditions in particulate matters or upwelling region, the costal region has been assumed to be a spot to contribute large emissions of these gases. However, their source strengths reveal large variability depending on the place and the time the measurements were conducted. To draw reliable emission strengths of CH_4 and N_2O in the coastal region, it is necessary to frequently measure them in large areas of the coast. A few measurements of CH_4 in water column around Korean peninsula have been reported while dissolved N_2O has never been observed. Here we present dissolved CH_4 and N_2O concentrations measured along the east and southeast coast of Korean peninsula in July, 2009. The campaign was carried out on board R/V Ieodo and the dissolved gases were analyzed in situ. Water samples collected by Niskin bottles were sub-sampled in a specially-designed glass container. Using ahead-space equilibrium technique dissolved gases were extracted and analyzed in a gas chromatographic system. Dissolved CH_4 and N_2O increased with depth in the most water columns while in several stations maxima were observed above the deepest water. We will discuss the observations in the presentation.