



## Measurements of atmospheric gaseous elemental mercury (GEM) and GEM fluxes in the seas of Southeast Asia in October-December 2019

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Measurements of gaseous elemental mercury (GEM) in the marine boundary layer (MBL) and GEM evasion fluxes were carried out during the Russian-Vietnam cruise conducted from the Sea of Japan to the South China Sea from October 25 to December 7, 2019. All GEM measurements were performed using two RA-915M mercury analysers (Lumex LLC, Russia). Atmospheric GEM concentrations were measured at two levels (about 2 m and 20 m above the sea surface) with a time resolution of 30 minutes. GEM fluxes were measured in the South China Sea using a dynamic flux chamber.

GEM concentrations ranged between 0.56 ng/m<sup>3</sup> and 25.47 ng/m<sup>3</sup>, and between 0.39 ng/m<sup>3</sup> and 23.95 ng/m<sup>3</sup> with medians of 1.38 ng/m<sup>3</sup> and 1.45 ng/m<sup>3</sup> for 2 m and 20 m measurements, respectively. GEM concentrations were significantly affected by air transport of GEM. Concentration Weighted Trajectory (CWT) analysis showed several source regions potentially influencing GEM concentrations in the ambient air during the cruise: the south of the South China Sea, Vietnam, the southeastern China, the south of Japan and the Korean peninsula. Maximum concentrations (up to 25 ng/m<sup>3</sup>) were registered in Haiphong (Vietnam).

Hg(0) fluxes measured at 7 stations in the South China Sea ranged from 1.1 ng/m<sup>2</sup>/h to 2.5 ng/m<sup>2</sup>/h, with median value of 2.07 ng/m<sup>2</sup>/h. These values were 1,5 times higher than those that were measured by the same method in the Sea of Japan and the Sea of Okhotsk a month earlier.

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