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Dataset name: **iCUPE Dataset (DS) from Deliverable 2.2.1:**

Dataset of Arctic atmospheric Hg(II) observations

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The produced dataset (in MS Excel format) contains concentrations of total divalent atmospheric mercury forms (HgII, in picograms per cubic meter of air, pg/m^3; at standard pressure and temperature, 0^{o}C, 1 atm) in air samples collected at the Zeppelin Observatory in Ny-Alesund (Svalbard - Norway) (78.92° N, 11.93° E) and at Villum Research Station in North-Greenland, (81°36' N, 16°40' W). The samples were collected on 47mm diameter Millipore polyethersulfone cation exchange membranes (ref# HPWP04700); air was pumped for 1 week, at 1 liter per minute nominally, over the filter which quantitatively collects aerosol HgII and gaseous divalent HgII forms. Sampling was conducted from 16/3/2018 to 11/6/2019 at Zeppelin, and from 1/5/2019 to 22/7/2019 at Villum. Samples were stored and transported frozen at -20^{o}C at all times, until analysis by cold vapor atomic fluorescence spectroscopy (CV-AFS) at GET-CNRS. Filter samples were leached in 16mL of ultra-pure bi-distilled acid (0.25 N HNO3 + 0.07N HCl), in 50mm closed PFA Teflon vessels, on a hotplate for 12h at 120^{o}C. Solutions

were analysed by CF-AFS, calibrated against NIST SRM 3133. External certified reference material NRC ORMS-4 (natural water, 22.0 ± ng/L) was analysed repeatedly with good results, 23.3 ± 2.3 ng/L, n=56. Expanded uncertainties of HgII concentrations in the dataset are based on field and analytical blanks, and duplicate samples.