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Measurements of oxidised mercury over the Equatorial Pacific Ocean: role of halogens

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Mercury is transported in the atmosphere primarily as its less reactive elemental form, although its reactivity and deposition to the surface environment are greatly enhanced following oxidation. Measurements of oxidized mercury in the polar (1,2) to sub-tropical (3-6) troposphere and global mercury transport modelling (7,8) have suggested that photolytically produced bromine atoms are the primary oxidant of atmospheric mercury. During the Climate and HAlogen Reactivity tropicaL EXperiment (CHARLEX) campaign we have conducted nine-months of mercury, ozone, and halogen measurements in the marine boundary layer on Galápagos Islands in the Equatorial Pacific Ocean. The gaseous elemental mercury concentration remains low throughout the year without any strong oceanic evasion signal. Considerable concentrations of oxidized mercury are measured around midday. We use a photochemical box model to assess the role of halogens in the oxidation of elemental mercury in this environment.

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