



Continuous measurements of perfluorocarbons at remote monitoring stations in Japan

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Perfluorocarbons (PFCs) are very powerful and long-lived greenhouse gases and their emissions are regulated under the Kyoto Protocol. Emission of PFCs may have increased in East Asia as a result of recent industrialization, but little is known about the emission strength. In order to find the importance of their regional sources, continuous measurements of C₂-C₄ PFCs along with some other VOCs have been performed with fully-automated preconcentration/gas chromatograph/mass spectrometer at two remote monitoring stations in Japan; at Hateruma island (24.1°N, 123.8°E) since 2004, and at Cape Ochiishi (43.1°N, 145.3°E) since 2006. The measurements showed that baseline concentrations of PFCs in 2008 were 3.9 ppt for PFC-116 (C₂F₆), 0.5 ppt for PFC-218 (C₃F₈), and 1.3 ppt for PFC-318 (C₄F₈). Enhanced concentrations above the baseline were occasionally observed over hours to days in air masses which had passed over urban areas in East Asia, suggesting great anthropogenic emission there. The measurements were used to determine the magnitude and distribution of the surface sources of PFCs in East Asia using a tagged simulation from three-dimensional transport model.