Continuous CH_4 measurements with the NIPR CFA system

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We have successfully developed the method for quasi-continuous CH_4 measurements by utilizing the previously wasted air from the Continuous Flow Analyses (CFA) system for ice core measurements (1). To achieve the goal, the whole CFA line was made leak-tight for gas, and the gas was roughly separated and further extracted from meltwater by "debubbler" and "online degasser", respectively (1, 2, 3, 4), and measured by a laser spectrometer (Picarro G2301, with 40-torr cavity pressure). The CH_4 values thus measured are always depleted from the original concentration in the ice core air bubbles because the gas extraction efficiency of the system is less than 100%. We calibrate the CH_4 concentration by running three standard gases with different known CH_4 concentrations at three different pressures through the system. In this presentation, we show our CH_4 data from various test measurements and discuss technical aspects and reliability of data. The next steps will be to analyze a shallow ice core from Greenland and a part of the second Dome Fuji ice core.

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