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Measurement and interpretation of gas phase formaldehyde concentrations obtained during the CHABLIS campaign in coastal Antarctica

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Abstract. Gas phase formaldehyde concentrations were measured during the 2004–2005 CHABLIS campaign at Halley research station, Antarctica. Data coverage span from May 2004 through to January 2005, thus capturing the majority of the year, with a wintertime minimum of near or below the instrumental detection limit rising to between 50 and 200 pptv during the austral summer. Factors controlling HCHO concentration include local chemical sources and sinks, and exchange with the snow surface. The measured seasonality is in line with previous observations from Neumayer station, with maximum in summer and minimum during the winter months, but with lower absolute concentrations throughout the year. The gas-phase production of HCHO was dominated by methane oxidation and a steady-state analysis showed that reactions of iodine and bromine species substantially reduced the predicted HCHO levels based upon in situ chemistry. This indicates a substantial additional HCHO source to be present that could be explained by a snowpack source.

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