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High Resolution CH_4-Measurements of Ice Cores using CFA

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Methane is the second most important greenhouse gas in the atmosphere. Rapid increases and decreases of the CH_4 concentration, as frequently registered during the last ice age for example (Dansgaard-Oeschger events), have been used as reliable time markers for the definition of a common time scale. Therefore, a basic information of a CH_4 record of an ice core is the synchronization of polar ice cores. In addition, these variations indicate changes primarily in the sources of methane associated with the presence of wetlands. In order to define the exact shape of such fast concentration changes, high resolution CH_4 measurements from ice cores are required.

Continuous Flow Analysis (CFA) is a well established method for high resolution measurements of chemical tracers in polar ice cores. Up to now, the air in the ice samples was not utilised and lost during the measurement process without scientific benefit. In our new system, all the air is extracted continuously and forwarded to a gas chromatograph for further gas analysis to provide high resolution CH_4 measurements.

This method, as well as first results from the Talos Dome ice core in the depth range of 1002-1278 m, are presented.