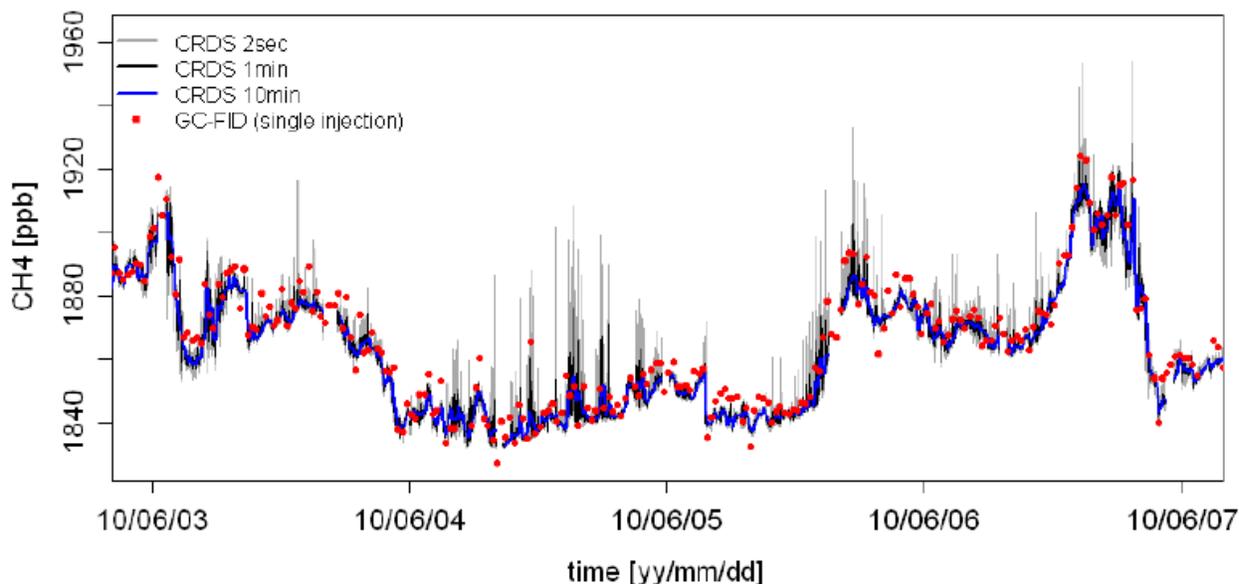


## Long-Term Methane Observations at the Global Atmosphere Watch Site Jungfraujoch with Gas Chromatography and Cavity Ringdown Spectroscopy

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*In situ* measurements of atmospheric methane ( $\text{CH}_4$ ) at Jungfraujoch started in February 2005 with gas chromatography and flame ionization detection (GC/FID). Ambient air measurements are performed every 24 minutes by analyzing discrete sample volumes. The sample air is dried prior to analysis by means of a Nafion dryer. In December 2009, a Cavity Ringdown Spectrometer (CRDS) for continuous  $\text{CH}_4$  and Carbon Dioxide ( $\text{CO}_2$ ) observations was installed next to the GC/FID. During the first 8 months of operation, the sample air was also dried prior to analysis by means of a Nafion dryer. As the instrument is also capable of measuring  $\text{H}_2\text{O}$ , no water vapor removal is used anymore (since August 2010). Thus,  $\text{CH}_4$  dry air mixing ratios are currently determined by analyzing the fully unaltered humid gas stream and subsequently applying an empirical humidity correction accounting for dilution and pressure broadening effects. This presentation will provide a comprehensive analysis of the more than one year data set of the side-by-side  $\text{CH}_4$  comparison. Besides a general evaluation of the GC/FID – CRDS agreement, particular attention will be paid to the long-term stability of the CRDS analyzer, the advantages of high time resolution monitoring at remote sites and the issue of sample drying. Figure 1 shows a 4-day time series of the  $\text{CH}_4$  mixing ratios measured with both techniques giving a first impression that the overall agreement is very good, no significant bias exists and the observed  $\text{CH}_4$  variability is well captured by both techniques.



**Figure 1.** 4-day time series of *in situ*  $\text{CH}_4$  mixing ratios at Jungfraujoch in June 2010 measured with CRDS and GC/FID. High-resolution data and 1min and 10min aggregates are shown for the CRDS, results of single injections are displayed for the GC/FID.