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Extending the atmospheric CH_4 record back to $\sim$800 kyr BP

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The on-going analyses of greenhouse gas mixing ratios on the EPICA Dome C (EDC) ice core have allowed to extend the Vostok records back through two additional glacial-interglacial cycles (the last 650 kyr) and to reveal at that time a smaller range of changes associated with a reduced amplitude of water isotopic changes in the same core (Siegenthaler et al., 2005 ; Spahni et al., 2005).

We will present here the status of the CH_4 measurements performed by the Grenoble and Bern gas teams in the EDC depth range 3060-3200 m. It corresponds to the time period 650-800 kyr BP, thus extending the record back to Marine Isotope Stage 20.2, according to the comparison with stacked marine isotopic curves.The depth resolution of our measurements reaches now 55 cm, thus still providing a $\sim$700 yr time resolution in the deepest sections.

These results will allow to discuss the CH_4 / Antarctic temperature relationship back through two other interglacial periods. The phase relationship between the two signals will be tentatively assessed. The time resolution should also allow to partly depict millennial-scale variability of methane during the glacial periods and to compare it with Dansgaard/Oeschger variability during the last glaciation.

Siegenthaler U. et al., Science 310, 1313-1317, 2005
Spahni R. et al., Science 310, 1317-1321, 2005