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Remote Sensing Observations of Greenhouse Gases from space based and airborne platforms: from SCIAMACHY and MaMap to CarbonSat

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Methane, CH4, e and carbon dioxide, CO_2, play an important role in the earth carbon cycle. They are the two most important long lived greenhouse gases produced by anthropogenic fossil fuel combustion. In order to assess accurately the surface fluxes of CH4 or CO_2. The Scanning Imaging Absorption Spectrometer for Atmospheric ChartographY, SCIAMACHY, was a national contribution to the ESA Envisat platform: the latter being launched on the 28th February 2002 and operating successfully until April 2012. The SCIAMACHY measurements of the up-welling radiation have been used to retrieve the dry mole fraction of XCH4 and XCO_2, providing a unique 10 year record at the spatial resolution of 60 kmx30 km. This data has been used to observe the changing CH4 abundance in the atmosphere and identify anthropogenic such as Fracking and natural sources such as wetlands. The Methane and carbon dioxide Mapper, MaMap, was developed as an aircraft demonstration instrument for our CarbonSat and CarbonSat Constellation concepts. CarbonSat is in Phase A B1 studies as one of two candidate missions for ESA's Earth Explorer 8 Mission. Selected results from SCIAMACHY and Mamap will be presented with a focus on methane and the perspective for CarbonSat.