Geophysical Research Abstracts, Vol. 7, 02986, 2005
SRef-ID: 1607-7962/gra/EGU05-A-02986

The flux of CO_2: Measuring atmospheric CO_2 from space

Michael Barkley[1], Paul Monks[2] and John Remedios[1]

1. EOS, Space Research Centre, University of Leicester, UK

2. Department of Chemistry, University of Leicester, UK

Over the last 200 years there has been a dramatic increase in the concentration of atmospheric CO_2. This is expected to lead to significant future climate change. To accurately predict the response of our climate requires a full understanding of the transport and storage of carbon within the carbon cycle. Satellite measurements of atmospheric CO_2 could help reduce the uncertainties in the carbon fluxes and provide insight into surface sources and sinks. Since the launch of the SCIAMACHY instrument on-board ENVISAT there is an ability to measure the global total columns of CO_2 in the near infrared (NIR) using a new retrieval technique called *Weighting Function Modified Differential Optical Absorption Spectroscopy* (WFM-DOAS), (Buchwitz *et al*., 2000). It is the aim of this research to exploit SCIAMACHY CO_2 measurements and other Earth observation data, to develop and use a procedure for monitoring fluxes of CO_2 on a systematic basis. The poster will introduce WFM-DOAS and give an initial assessment of the retrieval algorithm's sensitivity, highlighting the necessity for the inclusion of suitable *a priori* information within the retrieval in order to constrain the errors on the retrieved CO_2 columns. Furthermore preliminary results, for selected scenes, are shown obtained using a WFM-DOAS algorithm that is biased towards the *a priori* state of the SCIAMACHY measurement.

1 Reference

Buchwitz, M., Rozanov, V.V and Burrows J.P., 2000, A near infrared optimised DOAS method for the fast global retrieval of atmospheric CH_4, CO, CO_2, H_2O and N_2O total

column amounts from SCIAMACHY / ENVISAT-1 nadir radiances, *J. Geophys. Res*. **105**, 15231-15246