RETRIEVAL OF HEAVY MOLECULE PROFILES FROM MIPAS DATA USING A MULTI-SCALE APPROACH

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Level 1 products of MIPAS, the infrared limb sounder flown on the ENVISAT mission, are sequences of calibrated emission spectra. These spectra consist of sharp emission peaks, of broad band features, and of continuum contributions. Typical features used for the identification of light molecules are narrow band emission peaks, while heavy molecules can often be identified by their broad band emissions.

If we try to retrieve profiles of selected trace gases from MIPAS emission spectra, we can profit from these different emission characteristics by repeated splitting of measured and simulated spectra into frequency bands with different scales using so-called filter banks. The output of these filter banks allows the determination of individual trace gases due to their specific signal levels per band and scale.

We will demonstrate the potential of this technique for the retrieval of heavy molecules that are difficult to quantify otherwise.