

## PARTICIPATION TO ATMOSPHERIC OBSERVATION INSTRUMENTS OF THE EUROPEAN SPACE AGENCY POLAR PLATFORMS

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The call for proposals for the payloads of the ESA polar platforms led the proponents of the present project to participate to the design studies of four instruments : a stellar U.V.-visible occultation radiometer : GOMOS, a back scattered UV-visible sounder : SCIAMACHY, an infrared emission limb sounder : MIPAS and a microwave sounder : AMAS. These four instruments determine the composition of the middle and lower atmosphere with an accuracy unsurpassed by any existing instrument and which ambition is challenged only by the American proposals on the NASA polar platform. In particular, the proposed ozone soundings intend to resolve a 1% ozone variation within the four years duration of the mission. Aerosols are also observed as well as more than twenty minor gases. If the total of the four instruments would entirely constrain an atmospheric model, they are independent and each can supply unequaled informations, it is however preferable that all four fly on the same platform, the acquisition of the same final results by different techniques constituting the best verification. Long term accurate satellite observations are the most certain way to fulfil the objectives of the "Global Change" programme. The polar platform programme has indeed provisions for the archiving and maintenance of data on time scales never envisaged up to now.

Only the first three instruments are considered for the first polar platform scheduled for 1997, the ESA selection committee having considered the fourth : AMAS as worth including on the latter platforms. MIPAS has been selected as a facility instrument by ESA and will thus be developed with ESA funds. The SCIAMACHY concept is also approved as the GOME instrument by ESA for earlier satellites, beginning with ERS2. SCIAMACHY is financed by the national agencies of several ESA countries. GOMOS would be considered as an ESA facility instrument after completion of the current phase B study.

The common scientific objectives of these three instruments are to establish a planetary balance of  $O_3$ ,  $O_2$ ,  $NO$ ,  $NO_2$ ,  $CO$ ,  $CH_4$ ,  $N_2O$ ,  $CO_2$ ,  $OH$ , chlorofluoromethanes,  $N_2O_5$ ,  $HNO_4$ ,  $ClONO_2$ , aerosols and of all gases absorbing at the relevant wavelengths between ground and 100 km. during a four year period. Such a programme fits perfectly to the general objectives of the "Global Change" programme and can only be realistically fulfilled with space based techniques. Recent history has shown that atmospheric changes introduced in the Northern hemisphere troposphere have impacted the Antarctic stratosphere and thus that it is illusory to limit a study of atmospheric change limited to a single location.