Validation of SCIAMACHY total ozone column measurements by ground-based microwave observations of ozone at Kiruna, Mount Zugspitze, and Mérida

G. Kopp1, E. Brinksma2, H. Eskes2, G. Hochschild1, P. Hoffmann3, U. Raffalski4, and R. Van der A2

1 Institute of Meteorology and Climate Research, Forschungszentrum Karlsruhe and Universität Karlsruhe, Germany
2 Koninklijk Nederlands Meteorologisch Instituut, De Bilt, Netherlands
3 Faculty of Science, Universidad de Los Andes, Mérida, Venezuela
4 Swedish Institute of Space Physics, Kiruna, Sweden
The sites of our ground-based measurements

Kiruna
Zugspitze
Pico Espejo
Ozone over Kiruna (67.84°N, 20.41°E, 425 m asl) between 28 November 2002 and 24 October 2004 as measured by KIMRA
U. Raffalski, G. Hochschild, G. Kopp, and J. Urban

“Evolution of stratospheric ozone during winter 2002/2003 as observed by a ground-based millimetre wave radiometer at Kiruna, Sweden”

submitted to Atmospheric Chemistry and Physics
Ozone column densities over Kiruna as measured by SCIAMACHY and KIMRA

![Graph showing ozone column densities over Kiruna as measured by SCIAMACHY and KIMRA. The x-axis represents the day of the year 2003, and the y-axis represents ozone column density in DU. The graph includes data from SCIAMACHY L2 (SCIA/5.04), SCIAMACHY KNMI, and KIMRA. There is a highlighted area indicating high solar zenith angles.](image-url)
Ozone over Mount Zugspitze (47.4°N, 11°E, 2650 m asl) between 18 February and 16 July 2003 as measured by MIRA 2
Ozone column densities over Mount Zugspitze as measured by SCIAMACHY and MIRA 2

- SCIAMACHY L2 (SCIA/5.04)
- SCIAMACHY KNMI
- MIRA

day of the year 2003
Ozone over Pico Espejo (8°N, 71°W, 4765 m asl) between 27 May and 19 September 2004 as measured by MIRA 2
Ozone column densities over Pico Espejo as measured by SCIAMACHY and MIRA 2

![Graph showing ozone column densities over Pico Espejo]

- SCIAMACHY L2 (SCIA/5.04)
- MIRA

Day of the year 2004

Ozone column [DU]
Summary

• ground-based measurements of ozone vertical profiles and columns for several months at a polar, mid-latitude, and tropical sites

• microwave and SCIAMACHY ozone columns in general evolve quite parallel

• problems in Arctic SCIALMACHY L2 (SCIA/5.04) data under high solar zenith angles