

Validation of *SCIAMACHY* products with ground-based FTIR measurements at Kiruna and on Tenerife Island Project 50 EE 0008, Boden-FTIR-NDSC

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Two ground-based FTIR (Fourier Transform Infrared) Spectrometer
at IRF Kiruna (S) and at Izaña Observatory on Tenerife Island (E)



in the framework of the NDSC (Network for the Detection of Stratospheric Change)

Species: H₂O, N₂O, CH₄, NO, HNO₃, HCl, HF, O₃, OCS, HCN, CO, ClO, ClONO₂ & NO₂...

Outline: Some examples of

- time series of column amounts and profiles of some trace gases
- validation of *SCIAMACHY* data

Observation platform at the IRF Kiruna



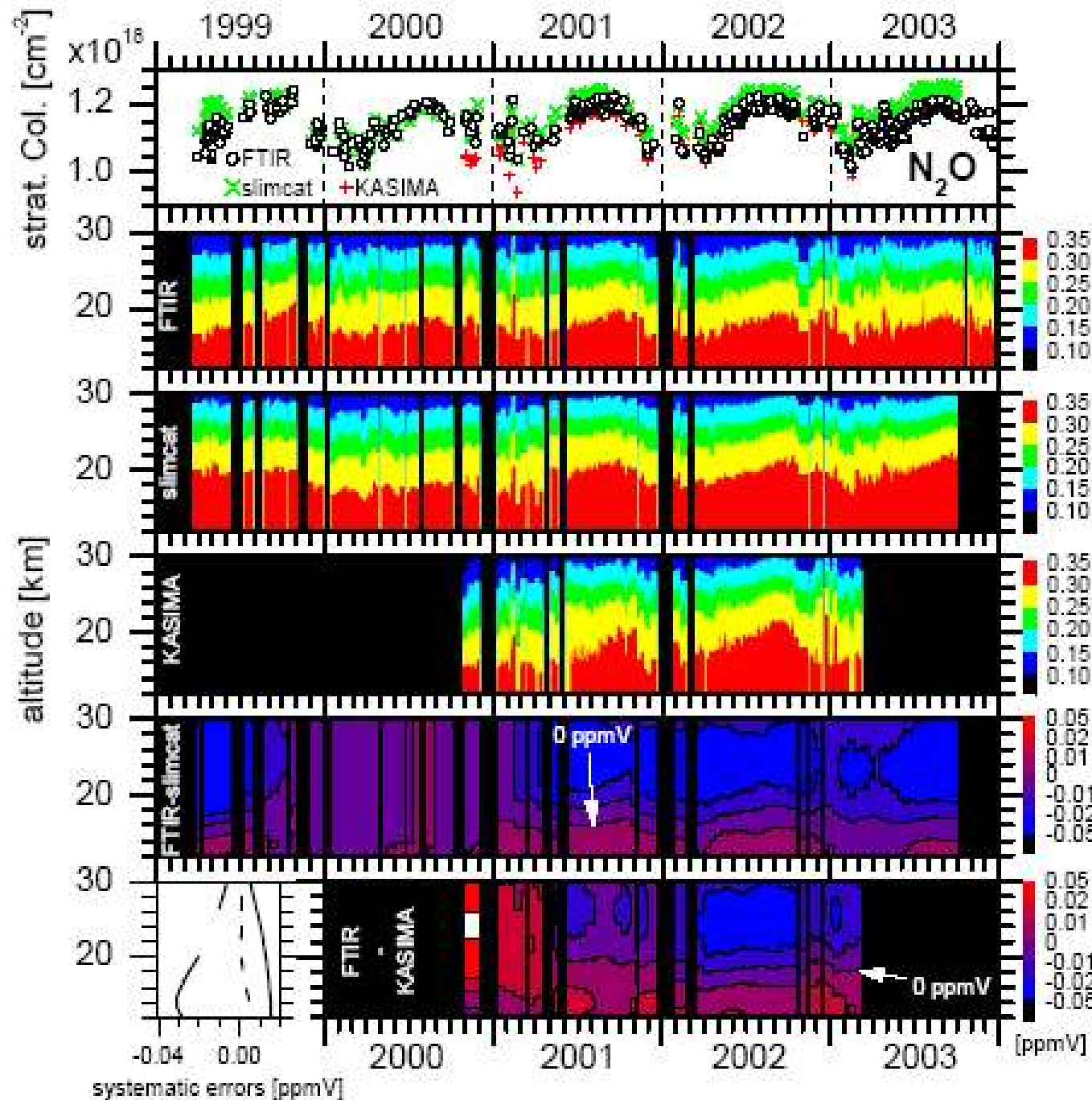
Container at Izaña Observatory, Tenerife Island



Measurements made within *SCIAMACHY* validation project period at Kiruna and on Tenerife Island

Numbers of days of observation within ENVISAT validation phase:

	2002	2003	2004	Total
Kiruna	53	89	85	227
Izaña	76	127	64	267
Total	129	216	149	494



N_2O , Izaña

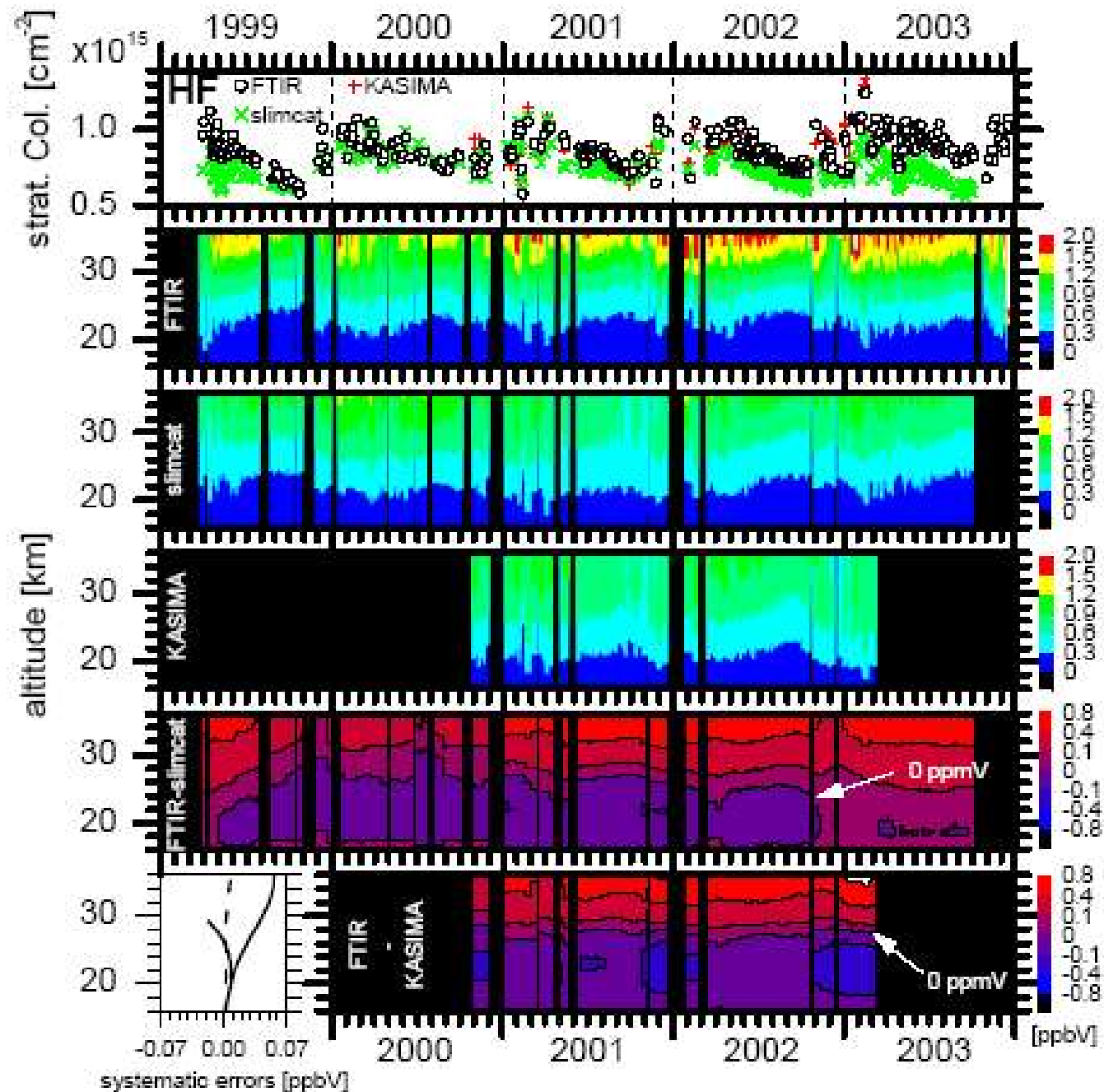
FTIR

SLIMCAT

KASIMA

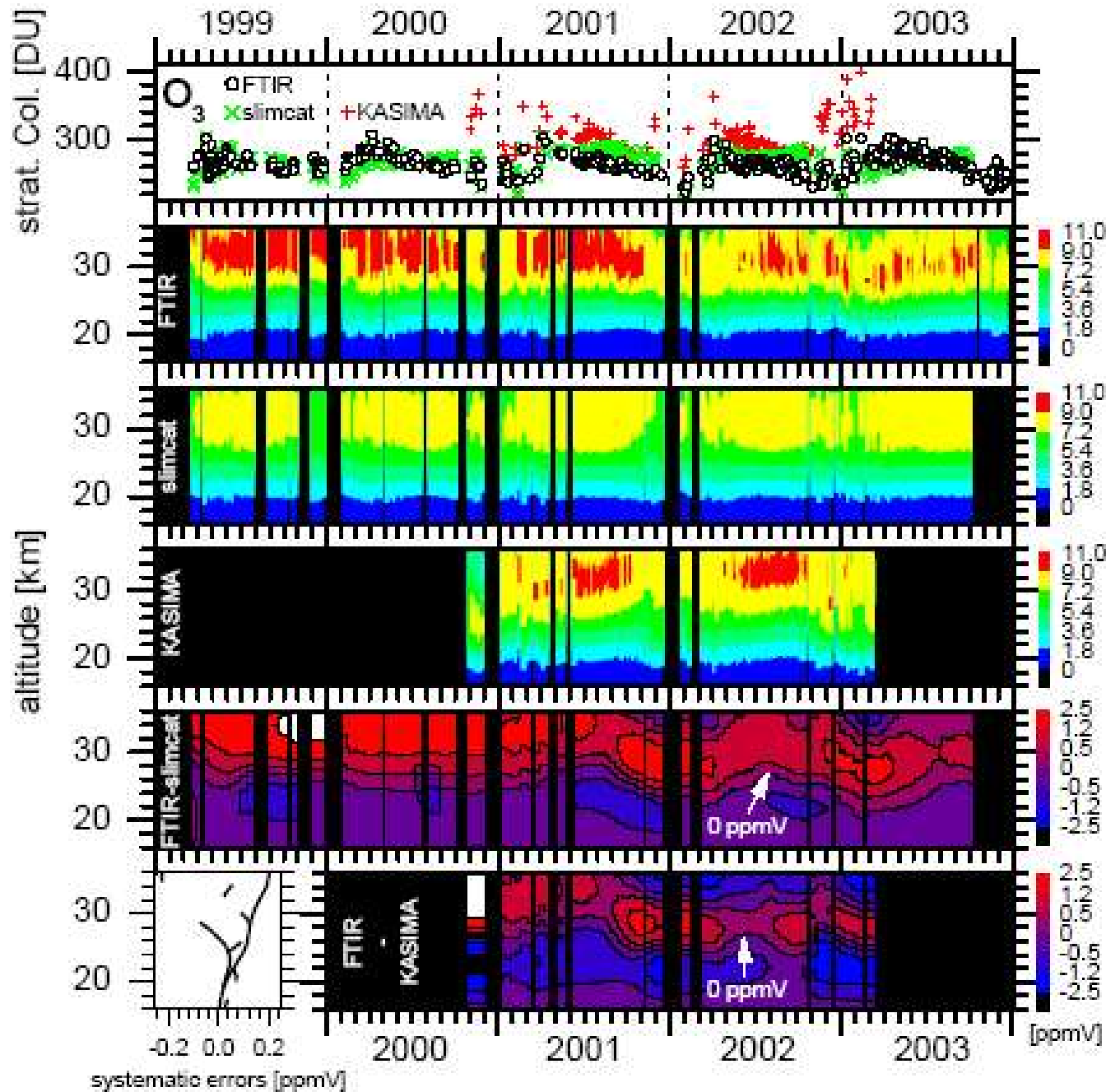
M. Schneider et al., ACPD
- Special Issue: 'Probing the
atmosphere in 3 dimensions
for SCIAMACHY',
ACPD 4, 5261-5301, 2004

HF, Izaña



FTIR
SLIMCAT
KASIMA

M. Schneider et al., ACPD - Special Issue: 'Probing the atmosphere in 3 dimensions for SCIAMACHY', ACPD 4, 5261-5301, 2004



O₃, Izaña

+ other species:

H₂O, CH₄, HNO₃, HCl, CO ...



FTIR



SLIMCAT



KASIMA

M. Schneider et al., ACPD
- Special Issue: 'Probing the
atmosphere in 3 dimensions
for SCIAMACHY',
ACPD 4, 5261-5301, 2004

Contributions to ESA Validation Workshop (ACVE), Frascati, 2002

T. Blumenstock A. Griesfeller, F. Hase, M. Schneider, H. Fischer, M. Gil, J.R. Moreta, U. Raffalski, U. Friess, G. Schwarz, E. Cuevas: Validation of MIPAS, and SCIAMACHY data by ground-based spectroscopy at Kiruna, Sweden, and Izaña, Tenerife Island (AOID-191).

K. Bramstedt, M. Buchwitz, U. Blum, T. Blumenstock, C. Frankenberg, P. von der Gathen, R. Koelemeijer, M. De Maziere, Andreas Richter, C. von Savigny, H. Schrivjer, Astrid Schulz, W. Steinbrecht: Comparison of scientific SCIAMACHY products with ground-based measurements.

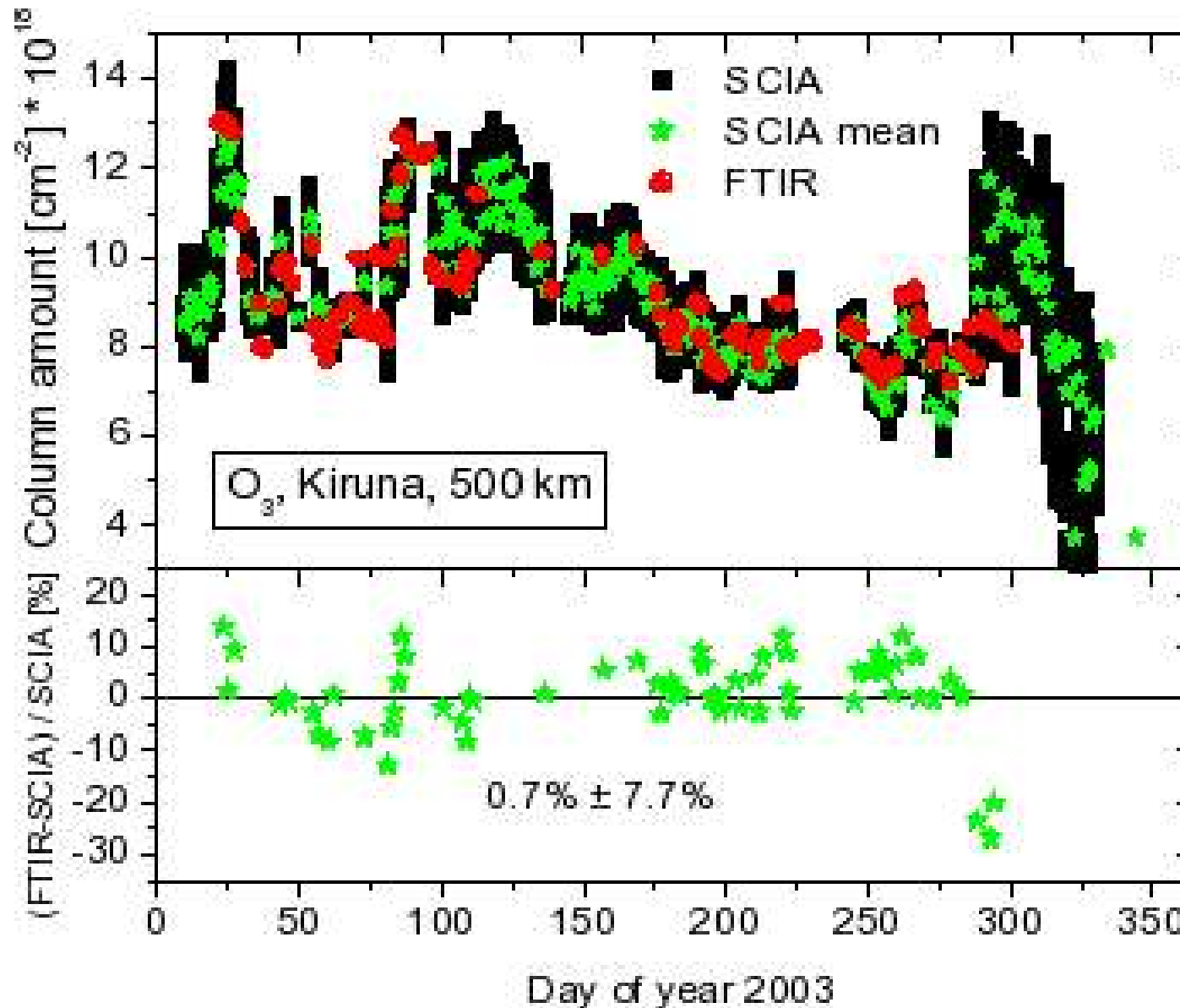
J.-C. Lambert, J. Granville, M. Allaart, T. Blumenstock, T. Coosemans, M. De Mazière, U. Friess, M. Gil, F. Goutail, D. V. Ionov, I. Kostadinov, E. Kyrö, A. Petritoli, A. PETERS, A. Richter, H. K. Roscoe, H. Schets, J. D. Shanklin, V. T. Soebijanta, T. Suortti, M. Van Roozendael, and C. Varotsos: Ground-based comparisons of early SCIAMACHY O₃ and NO₂ columns.

M. De Mazière, T. Coosemans, B. Barret, T. Blumenstock, A. Griesfeller et al. P. Demoulin, H. Fast, D. Griffith, N. Jones, E. Mahieu, J. Mellqvist, R. L. Mittermeier, J. Notholt, C. Rinsland, A. Schulz, D. Smale, A. Strandberg, R. Sussmann, S. Wood, M. Buchwitz: Validation of ENVISAT-1 level-2 products related to lower atmosphere O₃ and NO_y chemistry by an FTIR quasi-global network.

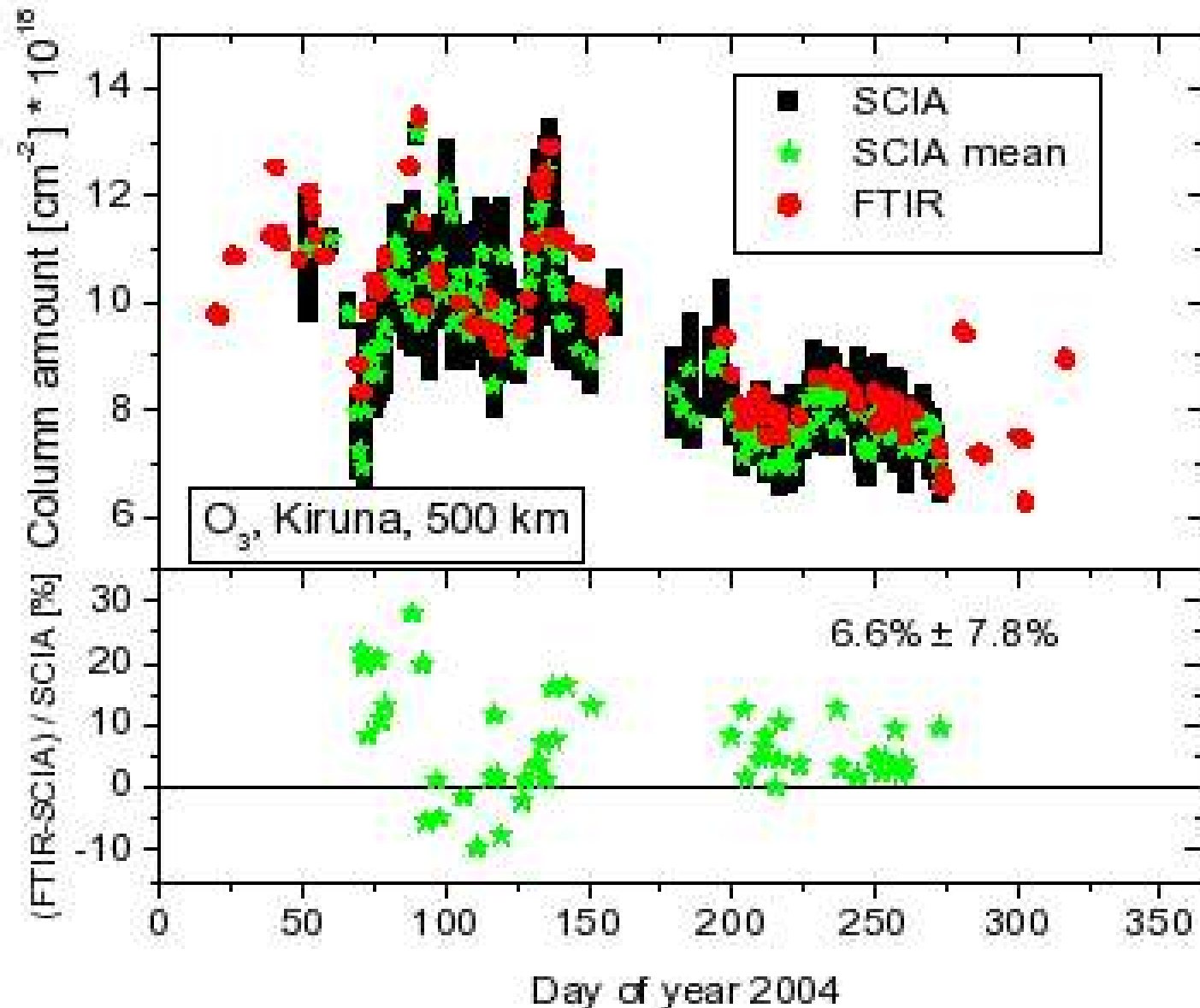
**Contributions to ESA Validation Workshop (ACVE-2),
Frascati, I, May 3-7, 2004, ESA SP-562:**

- T. Blumenstock et al.: Validation of MIPAS and SCIAMACHY data by ground-based spectroscopy at Kiruna, Sweden, and Izana, Tenerife Island (AOID-191), 358 – 363.
- E.J. Brinksma et al.: SCIAMACHY ozone profile validation.
- G. Kopp et al.: Validation of SCIAMACHY ozone column densities and profiles using ground-based FTIR and millimeter wave measurements, 272 – 278.
- J.-C. Lambert et al.: First ground-based validation of SCIAMACHY v5.01 O₃ column, 39 - 46 .
- J.-C. Lambert et al.: Geophysical validation of SCIAMACHY NO₂ vertical columns: Overview of early 2004 results, pp. 59 - 71.
- M. De Mazière et al.: Comparisons between SCIAMACHY scientific products and ground-based FTIR data for total columns of CO, CH₄ and N₂O, pp. 97 - 104.
- A. Richter et al.: A scientific NO₂ product from SCIAMACHY: First results and validation, 301 - 306.

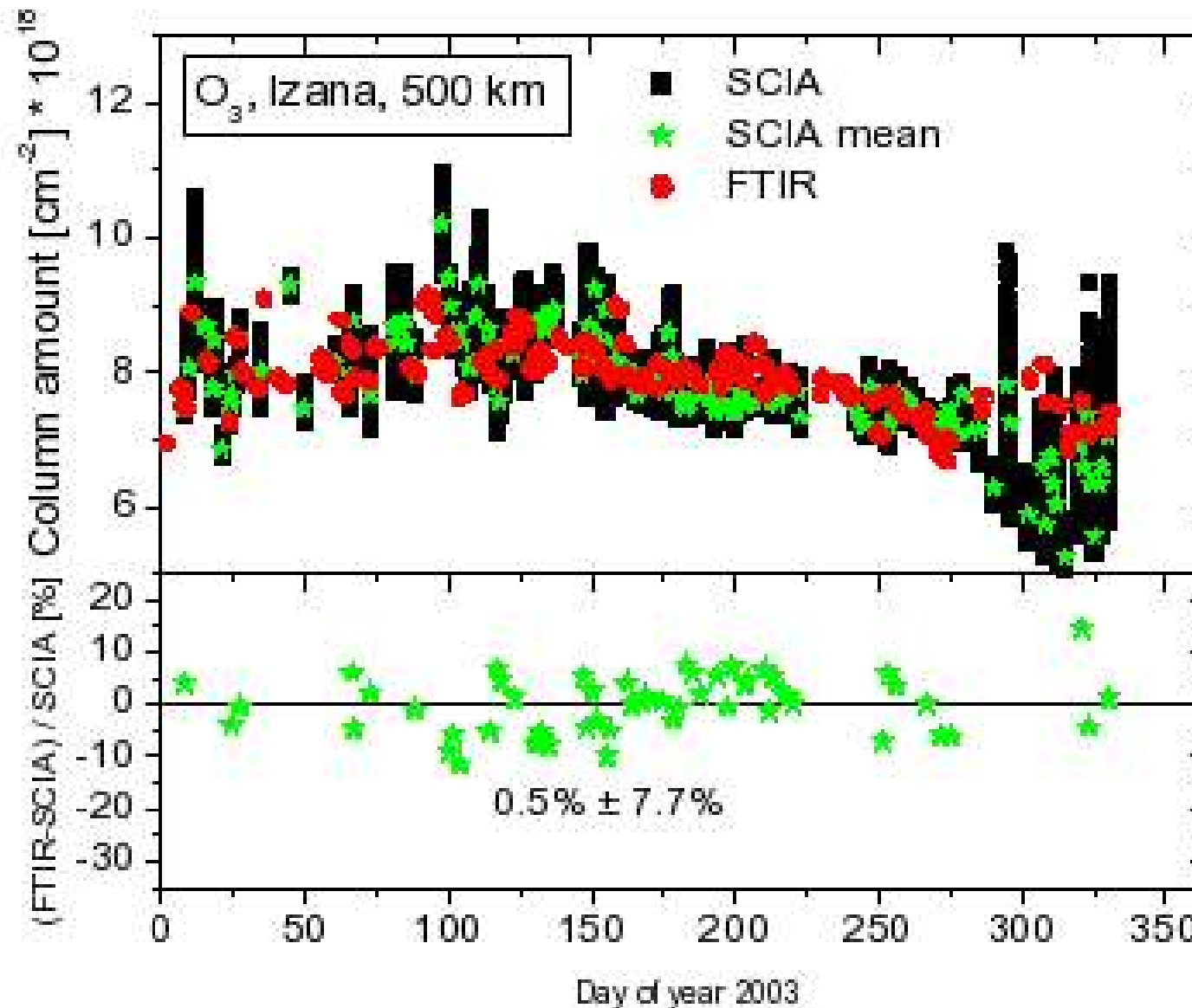
Comparison of O_3 column amounts from SCIAMACHY, vs. 5.04



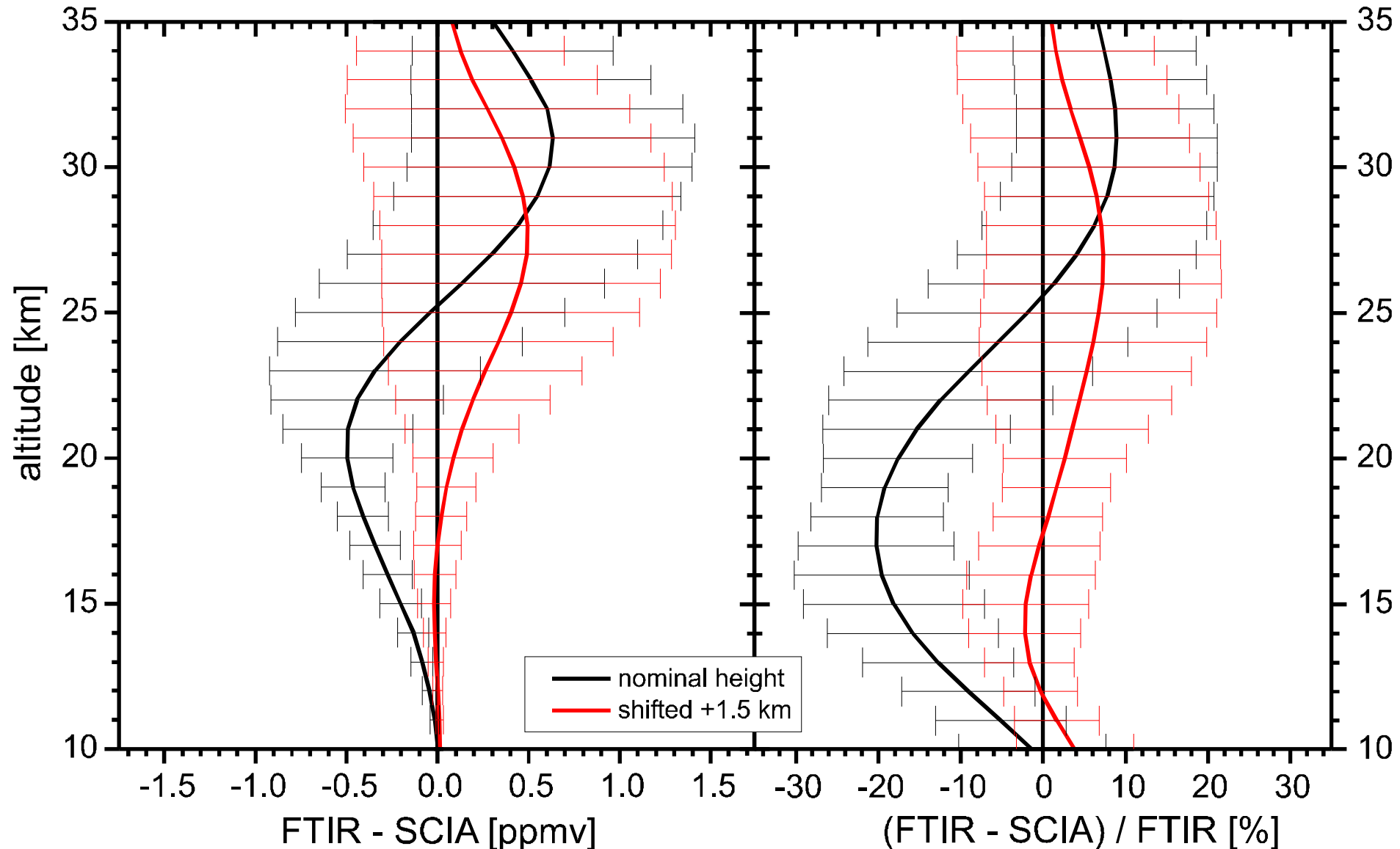
Comparison of O_3 column amounts from *SCIAMACHY*, vs. 5.04



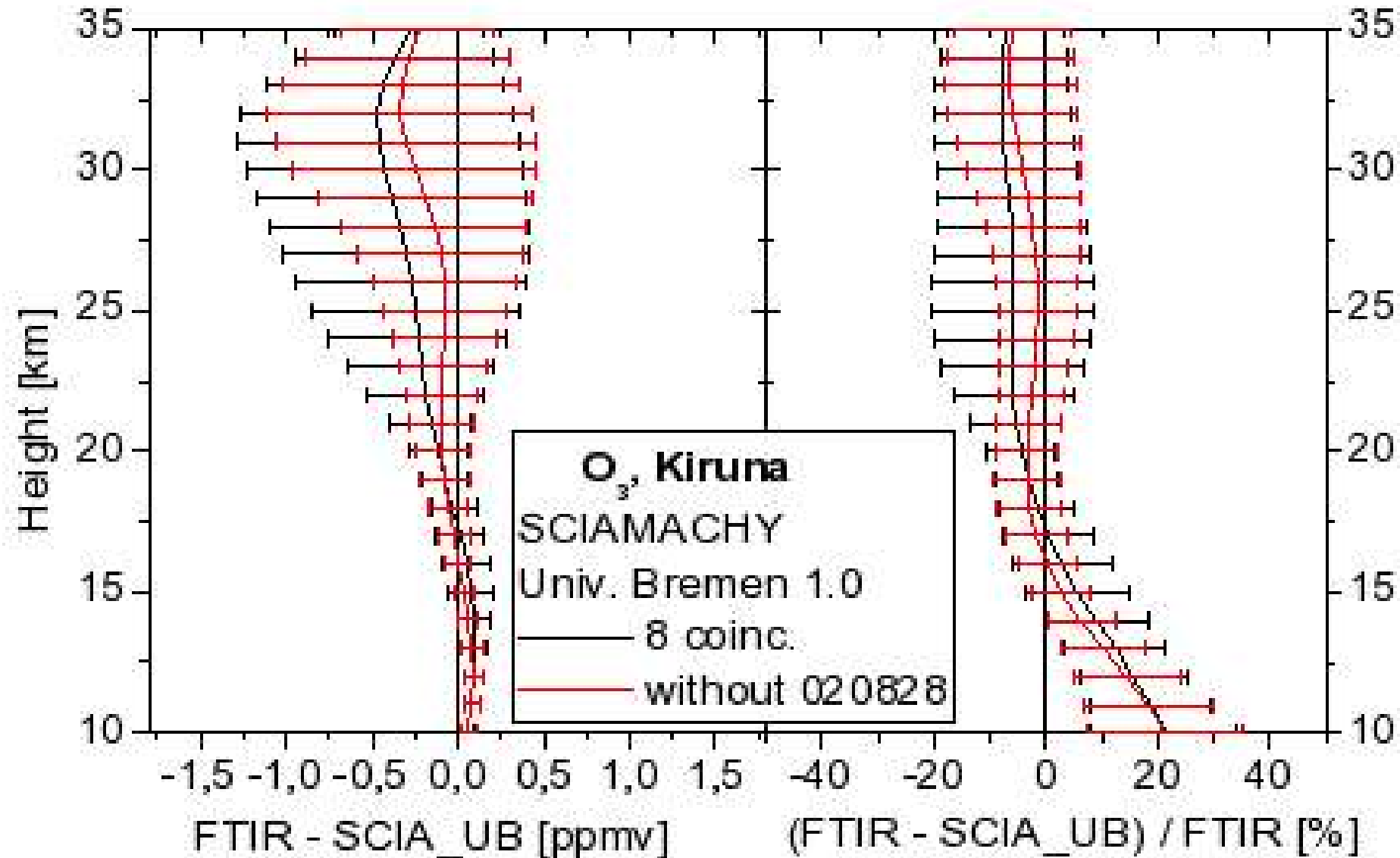
Comparison of O_3 column amounts from SCIAMACHY, vs. 5.04



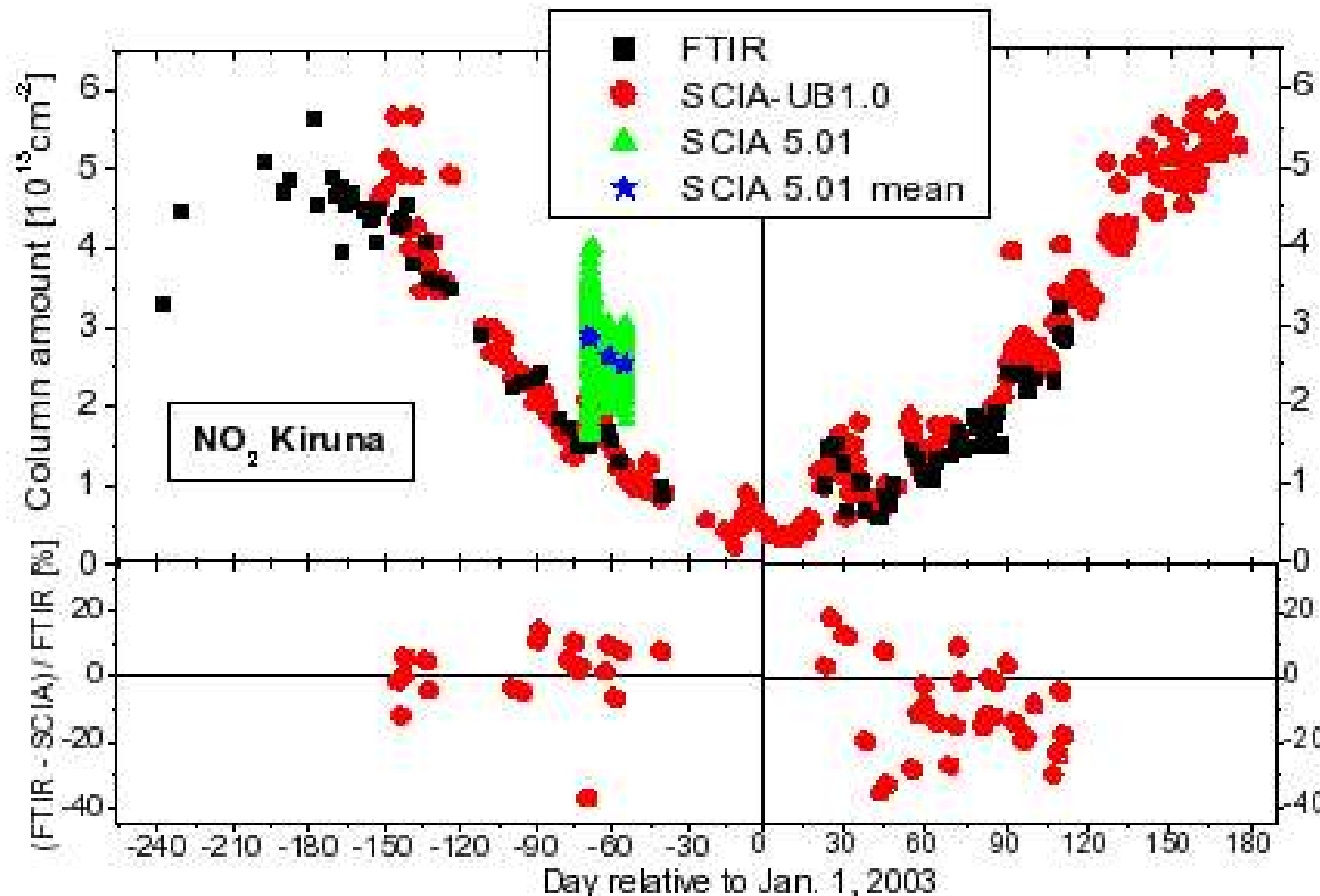
Comparison with O_3 profiles from *SCIAMACHY*, vs. 5.01



Comparison with O₃ profiles from SCIAMACHY SCIAMACHY data from University of Bremen (UB 1.0)



Comparison with NO₂ columns from *SCIAMACHY* *SCIAMACHY* data from University of Bremen (UB 1.0)



SCIAMACHY data from
University of Bremen
(UB 1.0)
ESA version 5.01

Summary

Number of measurement days (2002 – 2004) at Kiruna: 227

Number of measurement days (2002 – 2004) at Izaña: 267

Data on the CALVAL data base

ACP - Special Issue: 'Probing the atmosphere in 3 dimensions for SCIAMACHY':
M. Schneider et al.: Subtropical trace gas profiles determined by ground-based FTIR spectroscopy at Izaña ($28 \pm N$, $16 \pm W$): Five year record, error analysis, and comparison with 3D-CTMs, ACPD 4, 5261-5301, 2004.

Several papers on SCIAMACHY validation at
ENVISAT Validation Workshop (ACVE-1), Frascati, I, Dec. 2002,
ENVISAT Validation Workshop (ACVE-2), Frascati, I, May 2004,
Quadr. Ozone Symposium, Kos, June 2004.

Validation of SCIAMACHY data:

SCIAMACHY	O ₃	profiles
SCIAMACHY	O ₃	columns
SCIAMACHY	NO ₂	columns