JOINT-RETRIEVAL MICROWINDOWS

- selection of the best target microwindow for each species (out of 30 trials)
- selection of the two best microwindows for joint retrieval of each pair of species
- comparison between the information content of the joint-retrieval and the total information content using the single species microwindows

BEST SEQUENCE of TARGET SPECIES MICROWINDOWS

- computation of the information content for pairs of species retrieved sequentially
- first in sequence using **climatological** uncertainty of the second species as a contaminant
- second in sequence using **retrieval** uncertainty of the first species as a contaminant
- comparison of the total information of each sequence to find best order

Method of Selection:

- Mid-latitude day-time atmosphere
- selection according to total error only
- no CPU cost
- pointwise plus mask optimisation plus mask uniformity
- 6 - 68 km altitude range (in 17 steps)
- No continuum requirement (allows opaque tangent paths)

Joint-Retrieval Microwindows							
RTV	**pT**	**H_2O**	**O_3**	**CH_4**	**HNO_3**	**N_2O**	**NO_2**
pT	**63.7**	99.0	129.7	104.2	93.5	107.4	86.0
H_2O	36.2	**28.4**	81.0	66.1	65.7	52.7	63.3
O_3	66.0	6.6	**46.0**	81.5	76.7	79.3	71.3
CH_4	40.5	-2.8	-5.0	**40.5**	53.1	69.8	67.2
HNO_3	29.8	7.4	0.8	-17.3	**29.9**	64.5	55.2
N_2O	43.7	-9.2	0.2	-4.2	1.5	**33.5**	58.2
NO_2	22.3	9.6	0	1.4	0	-0.6	**25.3**

Conclusion

Preliminary results show that it is worth doing:

- pT and O_3, H_2O, N2O, CH4, HNO3, NO2
- H_2O and NO_2, HNO_3, O_3
- O_3 and HNO_3 (?)
- CH_4 and NO_2(?)

Work in Progress

- selection of pT + H_2O + O_3
- selection of pT+ all target species

Best Sequence of Species							
RTV	**H_2O**	**O_3**	**CH_4**	**HNO_3**	**N_2O**	**NO_2**	**Total**
H_2O		0.7	1.4	2.2	0.8	0.2	5.3
O_3	0.5		0	0	0	0	0.5
CH_4	0	0		0	0	0	0
HNO_3	0	0	0		0	0	0
N_2O	0	0	0	0		0	0
NO_2	0	0	0	0	0		0

Conclusion

Best sequence of target species microwindow is:

$H_2O \rightarrow O_3 \rightarrow$ no particular order