















1. Which of the following options best describes the industry you work in?

		Response Percent	Response Count
National government		29.0%	20
International government		4.3%	3
Academic/University		53.6%	37
Commercial		1.4%	1
Non-Governmental Organisation / Not-for-Profit		4.3%	3
Space agency		2.9%	2
Other		4.3%	3
	Other (please specify)		2
answered question			69
skipped question			0

2. Which of the following options best describes the target audience of your work?

		Response Percent	Response Count
Decision-support (Commercial)		0.0%	0
Decision-support (Government)		13.0%	9
Scientific community		84.1%	58
Other		2.9%	2
	Other (please specify)		3
answered question			69
skipped question			0





3. Which atmospheric parameter do you use most frequently?

		Response Percent	Response Count
Amounts of nitrogen dioxide (NO2)		29.7%	19
Amounts of formaldehyde (HCHO)		4.7%	3
Amounts of carbon monoxide (CO)		17.2%	11
Other		48.4%	31
answered question			64
skipped question			5



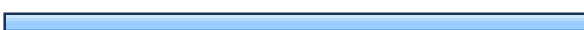

4. Please name the product you use.

	Response Count
	26
answered question	26
skipped question	43


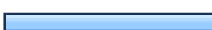

5. Type(s) of product used?

		Response Percent	Response Count
Total slant column		47.1%	8
Total vertical column		41.2%	7
Tropospheric slant column		47.1%	8
Tropospheric vertical column		88.2%	15
Other (please specify)			1
answered question			17
skipped question			52





6. Product(s) used?

		Response Percent	Response Count
Retrievals from ERS-2 / GOME-1		43.8%	7
Retrievals from ENVISAT / SCIAMACHY		68.8%	11
Retrievals from Aura / OMI		93.8%	15
Retrievals from MetOp / GOME-2		68.8%	11
	Other (please specify)		1
		answered question	16
		skipped question	53

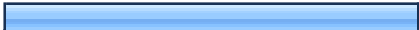


7. Type(s) of product used?

		Response Percent	Response Count
Total slant column		0.0%	0
Total vertical column		33.3%	1
Tropospheric slant column		33.3%	1
Tropospheric vertical column		100.0%	3
Other		0.0%	0
		Other (please specify)	0
		answered question	3
		skipped question	66







8. Product(s) used?

		Response Percent	Response Count
Retrievals from ERS-2 / GOME-1		100.0%	3
Retrievals from ENVISAT / SCIAMACHY		100.0%	3
Retrievals from Aura / OMI		100.0%	3
Retrievals from MetOp / GOME-2		100.0%	3
Other		0.0%	0
	Other (please specify)		0
		answered question	3
		skipped question	66

9. Type(s) of product used?

		Response Percent	Response Count
Total slant column		0.0%	0
Total vertical column		66.7%	6
Tropospheric slant column		0.0%	0
Tropospheric vertical column		66.7%	6
Other		11.1%	1
	Other (please specify)		3
		answered question	9
		skipped question	60

10. Product(s) used?

		Response Percent	Response Count
Retrievals from Terra / MOPITT		88.9%	8
Retrievals from Aqua / AIRS		44.4%	4
Retrievals from ENVISAT / SCIAMACHY		33.3%	3
Retrievals from Aura / TES		22.2%	2
Retrievals from MetOp / IASI		77.8%	7
Other		11.1%	1
	Other (please specify)		1
		answered question	9
		skipped question	60

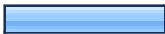

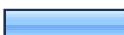



11. For each application please specify the typical time-step

	Hourly	6-hourly	Daily	Weekly	8-day	10-day	Bi-weekly	16-day	Monthly
Radiation balance	16.7% (3)	22.2% (4)	16.7% (3)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	33.3% (6)
Climate modelling	5.3% (1)	10.5% (2)	26.3% (5)	0.0% (0)	0.0% (0)	0.0% (0)	5.3% (1)	0.0% (0)	36.8% (7)
Weather monitoring	50.0% (5)	30.0% (3)	20.0% (2)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)
Urban	31.3% (5)	6.3% (1)	31.3% (5)	12.5% (2)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	12.5% (2)
Disturbance	40.0% (2)	0.0% (0)	40.0% (2)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)
Carbon modelling	0.0% (0)	0.0% (0)	66.7% (4)	16.7% (1)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)
Ecosystem productivity modelling	0.0% (0)	0.0% (0)	50.0% (1)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)
Phenology	0.0% (0)	0.0% (0)	33.3% (1)	0.0% (0)	33.3% (1)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)
Cal/Val of the product	31.3% (5)	6.3% (1)	56.3% (9)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	6.3% (1)
Retrieval of derived product	22.2% (4)	0.0% (0)	66.7% (12)	5.6% (1)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)
Validation of (comparison with) other observation data product	29.0% (9)	9.7% (3)	48.4% (15)	3.2% (1)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	6.5% (2)
Air quality monitoring	43.5% (10)	13.0% (3)	21.7% (5)	8.7% (2)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	8.7% (2)
Air quality record (re)analysis	36.8% (7)	10.5% (2)	26.3% (5)	5.3% (1)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	15.8% (3)
Pollution forecast	50.0% (6)	8.3% (1)	33.3% (4)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)
Emission inventory constraint	13.6% (3)	4.5% (1)	45.5% (10)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	31.8% (7)
Tropospheric chemistry and/or climate model evaluation	20.7% (6)	13.8% (4)	34.5% (10)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	27.6% (8)

Tropospheric chemistry and/or climate model constraint (boundary conditions)	26.7% (4)	20.0% (3)	33.3% (5)	6.7% (1)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	6.7% (1)
Tropospheric chemistry and/or climate model constraint (data assimilation)	26.7% (4)	26.7% (4)	26.7% (4)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	20.0% (3)
Long-range transport studies	9.5% (2)	14.3% (3)	52.4% (11)	0.0% (0)	0.0% (0)	4.8% (1)	0.0% (0)	0.0% (0)	14.3% (3)
Population exposure to air pollution	46.2% (6)	7.7% (1)	15.4% (2)	7.7% (1)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)
Environmental policy reporting	0.0% (0)	0.0% (0)	42.9% (3)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	42.9% (3)
Other	33.3% (1)	33.3% (1)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)

If you indicated other above please indicate

12. Temporal range of data required for analysis:








		Response Percent	Response Count
Individual dates		25.5%	12
Less than or equal to a year		4.3%	2
More than a year		19.1%	9
Entire record available, whatever it is.		57.4%	27
Entire record available, that is (please specify below)		4.3%	2
Other(please specify below)		4.3%	2

4

answered question 47

skipped question 22

13. Temporal resolution of data required for analysis

		Response Percent	Response Count
Hourly		38.6%	17
6-hourly		22.7%	10
Daily		47.7%	21
Weekly		9.1%	4
8-day		0.0%	0
10-day		2.3%	1
Bi-weekly		0.0%	0
16-day		0.0%	0
Monthly		15.9%	7
Annual		6.8%	3
	Other (please specify)		7
answered question			44
skipped question			25




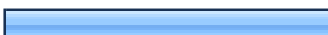
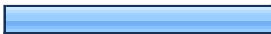

14. Horizontal extent of data required for analysis:

		Response Percent	Response Count
Site analysis		31.1%	14
Region		40.0%	18
Continental		20.0%	9
Global		71.1%	32
Biome		2.2%	1
Specific land cover classification		2.2%	1
Other		4.4%	2
	Other (please specify)		2
answered question			45
skipped question			24


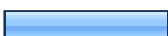






15. Horizontal resolution of data required for analysis:

		Response Percent	Response Count
Use pixel resolution as is (please state below)		74.4%	32
Aggregate over an area		34.9%	15
Other (please state below)		9.3%	4
	(Please state longitude x latitude OR along track x across track)		11
answered question			43
skipped question			26

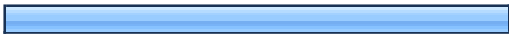
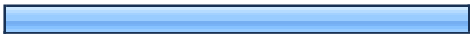
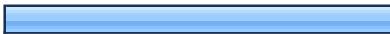


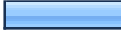



16. Vertical range of data (with effective sensitivity) required for analysis: (please specify the vertical range wherein meaningful information really contributed by the measurement is required)

		Response Percent	Response Count
Surface		59.5%	25
Boundary layer		85.7%	36
Free troposphere		88.1%	37
Upper troposphere / Lower stratosphere (UTLS)		52.4%	22
Stratosphere		42.9%	18
Mesosphere		7.1%	3
	Other (please specify)		3
answered question			42
skipped question			27

17. Vertical resolution of data required for analysis:

		Response Percent	Response Count
Total column		11.9%	5
Partial column: Tropospheric column		26.2%	11
Partial column: Stratospheric column		0.0%	0
Partial column: Boundary layer		2.4%	1
100 m - 500 m		11.9%	5
1 km - 2 km		16.7%	7
3 km - 5 km		4.8%	2
6 km - 10 km		2.4%	1
Layers with independent information within specified vertical range		23.8%	10
Number of layers with independent information (please specify below)		0.0%	0
	Other (please specify)		4
		answered question	42
		skipped question	27


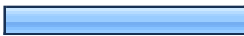

18. Have you any requirements (and if so, what are they?) regarding the data you analyse in terms of:

		Response Percent	Response Count
Systematic uncertainty		81.3%	13
Random uncertainty		75.0%	12
Long-term stability of data record		62.5%	10
Dependence on solar zenith angle		37.5%	6
Dependence on ground albedo		25.0%	4
Dependence on surface thermal emissivity		18.8%	3
Dependence on atmospheric temperature (weighted profile)		25.0%	4
Dependence on cloud cover, cloud height, cloud optical thickness		50.0%	8
Other		37.5%	6
answered question			16
skipped question			53



19. Please indicate below.

	Very Important	Important	Indifferent	Unimportant	Rating Average	Rating Count
How important is it to you and for your application that you know the nature of the entire processing chain of the dataset you are using?	39.5% (15)	47.4% (18)	7.9% (3)	5.3% (2)	3.21	38
How important is it to you that this information is available?	68.4% (26)	28.9% (11)	0.0% (0)	2.6% (1)	3.63	38
answered question						39
skipped question						30

20. Is this information easily accessible?

		Response Percent	Response Count
Yes		41.0%	16
No		38.5%	15
Don't know		20.5%	8
answered question			39
skipped question			30

21. If this documentation was more easily accessible would you use it?

		Response Percent	Response Count
Yes		91.7%	22
No		8.3%	2
answered question			24
skipped question			45



22. As you answered yes to the previous question, please explain how you would use this information.

	Response Count
	20
answered question	20
skipped question	49

23. As you answered yes to the previous question, please explain where you obtain this information.

	Response Count
	17
answered question	17
skipped question	52



24. Do some of the products you use include uncertainty values or a statement of confidence associated with the variables contained within those products?

		Response Percent	Response Count
Yes		89.2%	33
No		10.8%	4
	answered question		37
	skipped question		32

25. If uncertainty information was provided, how useful would it be to you?

	Very Useful	Useful	Indifferent	Not Useful	Don't know	Rating Average	Rating Count
	50.0% (3)	33.3% (2)	0.0% (0)	0.0% (0)	16.7% (1)	2.00	6
answered question							6
skipped question							63

26. Do you make use of this uncertainty information?

		Response Percent	Response Count
Yes		82.4%	28
No		17.6%	6
answered question			34
skipped question			35

27. How is the uncertainty information provided? (e.g. per pixel, by scene etc)

	Response Count
	28
answered question	28
skipped question	41

28. How is the uncertainty value provided? (e.g. %, in product units, etc.)

	Response Count
	28
answered question	28
skipped question	41

29. How do you make use of them? (e.g. weighting, data assimilation etc.)

	Response Count
	28
answered question	28
skipped question	41

30. Why don't you make use of the uncertainty information?

	Response Count
	7
answered question	7
skipped question	62



31. What uncertainty information would you want? (e.g. per pixel, per scene etc.)

	Response Count
	10
answered question	10
skipped question	59



32. How would you make use of this? (e.g. weighting, data assimilation, thresholding/masking etc.)

	Response Count
	10
answered question	10
skipped question	59

33. Do some of the products you use contain quality flags?

		Response Percent	Response Count
Yes		94.4%	34
No		5.6%	2
answered question			36
skipped question			33

34. Do you make use of these quality flags ?

		Response Percent	Response Count
Yes		94.4%	34
No		5.6%	2
answered question			36
skipped question			33



35. As you answered yes to the previous question, please tell us how you make use of the quality flags? (e.g thresholding, masking etc)

	Response Count
	35
answered question	35
skipped question	34

36. As you answered no to the previous question, please tell us why don't you utilise the information provided in the quality flags?

	Response Count
	2
answered question	2
skipped question	67




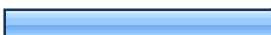












37. Are the quality flags contained in the product(s) sufficient for your application?

		Response Percent	Response Count
Yes		85.7%	30
No		14.3%	5
	answered question		35
	skipped question		34





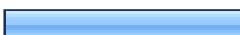






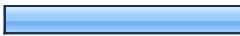

38. As you answered no to the previous question, please explain why.

	Response Count
	5
answered question	5
skipped question	64

39. What information would you like to see provided as a quality flag?

		Response Percent	Response Count
Backup algorithm		28.6%	2
Algorithm failure		42.9%	3
Saturation		42.9%	3
Gap filling, temporal filling, interpolation		42.9%	3
Cloud contamination		71.4%	5
Cloud shadow		42.9%	3
Aerosol contamination		57.1%	4
Land or sea		28.6%	2
Retrieval algorithm or backup algorithm		28.6%	2
Sensor (drop out, striping)		42.9%	3
Saturation		28.6%	2
Sea/ice conditions		28.6%	2
Sun glint		42.9%	3
Gap filling, temporal filling, interpolation		28.6%	2
All of the above		28.6%	2
Other		42.9%	3
	Other (please specify)		3
answered question			7
skipped question			62

40. What additional information would you like to see provided as a quality flag?

		Response Percent	Response Count
Cloud contamination		64.5%	20
Cloud shadow		16.1%	5
Aerosol contamination		48.4%	15
Land or sea		35.5%	11
Retrieval algorithm or backup algorithm		38.7%	12
Algorithm failure		54.8%	17
Sensor (drop out, striping)		45.2%	14
Saturation		25.8%	8
Sea/ice conditions		25.8%	8
Sun glint		45.2%	14
Gap filling, temporal filling, interpolation		22.6%	7
All of the above		38.7%	12
Other		12.9%	4
	Other (please specify)		4
		answered question	31
		skipped question	38

41. Do some of the products you use include any qualitative statement about their accuracy (closeness to truth)?

	Response Count
	26
answered question	26
skipped question	43

42. Do some of the products you use include any information content diagnostics / analysis? (e.g. averaging kernels and covariance matrix, enabling examination of the meaningfulness of the data)

**Response
Count**

28

answered question

28

skipped question

41

43. Which other quality information supplied with the product you use do you find useful?

**Response
Count**

10

answered question

10

skipped question

59

44. Which other quality information NOT supplied with the product you use would you find useful?

**Response
Count**

10



answered question

10

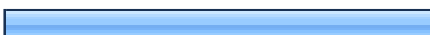


skipped question

59

45. Would you value advice on how to evaluate uncertainty in your application? (e.g. forum in which to ask questions, share best practices etc.)

		Response Percent	Response Count
Yes (please leave your details at the end of this survey)		54.5%	18
No		45.5%	15
answered question			33
skipped question			36




46. Is the product you use most frequently validated for your application?

		Response Percent	Response Count
Yes		68.8%	22
No		15.6%	5
Don't know		15.6%	5
answered question			32
skipped question			37




47. By whom is (are) the product(s) validated?

		Response Count
		20
answered question		20
skipped question		49




48. Is the validation information (i.e. detailed description of the validation method, process, geographical and vertical domains of validity) available?

		Response Percent	Response Count
Yes		78.3%	18
No		4.3%	1
Don't know		17.4%	4
answered question			23
skipped question			46



49. Is the validation information traceable to a standard (possibly SI)?

		Response Percent	Response Count
Yes		31.6%	6
No		31.6%	6
Don't know		36.8%	7
answered question			19
skipped question			50

50. Is the validation information fully documented?

		Response Percent	Response Count
Yes		73.7%	14
No		10.5%	2
Don't know		15.8%	3
answered question			19
skipped question			50

51. Is the validation information publicly available?

		Response Percent	Response Count
Yes		78.9%	15
No		10.5%	2
Don't know		10.5%	2
answered question			19
skipped question			50

52. What do you think of the overall quality of the product validation documentation (completeness, intelligibility)?

	Response Count
	18
answered question	18
skipped question	51


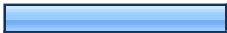
53. What do you think about the validation approach used? (assumptions, scaling etc.)

	Response Count
	18
answered question	18
skipped question	51

54. What do you think about the quality/uncertainty of the reference data used to validate the product?

	Response Count
	18
answered question	18
skipped question	51



55. Do you independently validate the product(s) that you use?

		Response Percent	Response Count
Yes		64.5%	20
No		35.5%	11
	answered question		31
	skipped question		38




56. As you answered yes to the previous question, please indicate how you conduct the product validation.

	Response Count
	20
answered question	20
skipped question	49



57. Would best practice guidelines (a set of documents describing the state-of-the-art, community agreed optimal method/s for undertaking a particular activity) for doing independent validation be useful to you?

		Response Percent	Response Count
Yes		87.1%	27
No		12.9%	4
answered question			31
skipped question			38



58. Do the end users of your work require any quality information?

		Response Percent	Response Count
Yes		71.0%	22
No		12.9%	4
Don't know		16.1%	5
answered question			31
skipped question			38



59. Do you think they should require quality information?

		Response Percent	Response Count
Yes		83.9%	26
No		0.0%	0
Don't know		16.1%	5
answered question			31
skipped question			38



60. Are you aware of the GEO Quality Assurance framework for Earth Observation, QA4EO, in principle applicable to any EO data?

		Response Percent	Response Count
Yes		19.4%	6
No		80.6%	25
answered question			31
skipped question			38



61. They have adequate quality indicators associated with them?

		Response Percent	Response Count
Yes		70.0%	21
No		30.0%	9
answered question			30
skipped question			39



62. These quality indicators are fully traceable to internationally agreed standards?

		Response Percent	Response Count
Yes		40.0%	12
No		60.0%	18
answered question			30
skipped question			39

63. These quality indicators provide sufficient information to allow you to readily evaluate the “fitness for purpose” of the data?

		Response Percent	Response Count
Yes		43.3%	13
No		56.7%	17
answered question			30
skipped question			39

64. Would you like to know the results of this survey?

		Response Percent	Response Count
Yes		58.1%	18
No		41.9%	13
answered question			31
skipped question			38

65. Name

		Response Count
		18
answered question		18
skipped question		51

66. Email address

		Response Count
		18
answered question		18
skipped question		51

67. If you have any comments about this survey, please provide them below.

	Response Count
	4
answered question	4
skipped question	65

Page 1, Q1. Which of the following options best describes the industry you work in?

1	TEST	Apr 22, 2014 10:14 AM
2	Government Parastatal	Apr 22, 2014 8:04 AM

Page 1, Q2. Which of the following options best describes the target audience of your work?

1	TEST	Apr 22, 2014 10:14 AM
2	TEST	Apr 17, 2014 4:14 PM
3	Both option Decision - support (Gov) and Scientific com.	Apr 17, 2014 2:36 PM

Page 3, Q1. Please name the product you use.

1	Temperature, Winds, Water Vapour	May 11, 2014 11:35 AM
2	Cloud fraction	May 2, 2014 2:58 PM
3	Amount of carbon dioxide and methane	May 2, 2014 11:47 AM
4	Aerosol optical depth	May 2, 2014 11:15 AM
5	Ozone	Apr 29, 2014 10:28 AM
6	aerosol AOD Cloud variables	Apr 25, 2014 10:08 AM
7	Atmospheric profiles and cloud products	Apr 23, 2014 6:52 PM
8	Ozone (O3) N2O methane (CH4)	Apr 22, 2014 3:44 PM
9	TEST	Apr 22, 2014 10:14 AM
10	ozone, carbon monoxide, nitrogen dioxide, sulphur dioxide, formaldehyde, carbon dioxide, methane, aerosol optical depth	Apr 22, 2014 10:01 AM
11	clouds, aerosols, radiation	Apr 22, 2014 9:09 AM
12	Moisture	Apr 21, 2014 7:57 PM
13	AOD, CLOUD FRACTION, RADIATION	Apr 19, 2014 6:46 PM
14	aerosols	Apr 17, 2014 3:18 PM
15	OMI OMSO2	Apr 17, 2014 3:07 PM
16	Atmospheric NH3	Apr 17, 2014 2:55 PM
17	aerosol	Apr 17, 2014 2:31 PM
18	NH3, AOD	Apr 17, 2014 2:29 PM
19	Aerosol	Apr 17, 2014 12:52 PM
20	temperature profiles	Apr 16, 2014 5:33 PM
21	ozone	Apr 15, 2014 12:39 PM
22	temperature, water vapor, ozone, cloud particles	Apr 15, 2014 2:01 AM
23	water vapor	Apr 15, 2014 12:56 AM
24	Ozone (O3), N2O, H2O, CH4	Apr 14, 2014 4:35 PM
25	Temperature	Apr 9, 2014 12:53 PM
26	Amounts of O3	Apr 9, 2014 12:03 PM

Page 4, Q1. Type(s) of product used?

1	TEST	Apr 17, 2014 4:26 PM
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Page 4, Q1. Type(s) of product used?**Page 4, Q2. Product(s) used?**

1	TEST	Apr 17, 2014 4:26 PM
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Page 6, Q1. Type(s) of product used?

1	with averaging kernel weighting	Apr 24, 2014 6:06 PM
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2	vertical profiles if available	Apr 17, 2014 3:07 PM
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3	vertical profiles from surface to stratosphere	Apr 14, 2014 5:10 PM
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Page 6, Q2. Product(s) used?

1	retrievals from MLS and ACE-FTS (SCISAT)	Apr 14, 2014 5:10 PM
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Page 7, Q1. For each application please specify the typical time-step

1	TEST	Apr 22, 2014 10:14 AM
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2	Seasonal means are often considered as well.	Apr 19, 2014 12:51 PM
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3	TEST	Apr 17, 2014 4:26 PM
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4	1 to 10 seconds or disturbance (turbulence)	Apr 15, 2014 2:03 AM
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Page 8, Q1. Temporal range of data required for analysis:

1	TEST	Apr 22, 2014 10:14 AM
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2	TEST	Apr 17, 2014 4:25 PM
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3	At least 20 yrs	Apr 16, 2014 5:35 PM
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4	Preferably entire records for various sensors.	Apr 9, 2014 1:30 PM
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Page 8, Q2. Temporal resolution of data required for analysis

1	Individual observation on a continuous basis	Apr 24, 2014 6:08 PM
2	TEST	Apr 22, 2014 10:14 AM
3	For satellite products we use the temporal resolution of the observed/retrieved quantity.	Apr 22, 2014 10:06 AM
4	Seasonal	Apr 19, 2014 12:52 PM
5	TEST	Apr 17, 2014 4:25 PM
6	orbit wise	Apr 14, 2014 4:52 PM
7	The data comes with daily overpass at the moment. This may become better in the future with geostationary instruments.	Apr 9, 2014 1:30 PM

Page 9, Q1. Horizontal extent of data required for analysis:

1	TEST	Apr 22, 2014 10:14 AM
2	TEST	Apr 17, 2014 4:25 PM

Page 9, Q2. Horizontal resolution of data required for analysis:

1	2x2.5 degrees	May 14, 2014 11:17 AM
2	this is defined by many factors	Apr 24, 2014 6:09 PM
3	0.5x0.5	Apr 22, 2014 3:47 PM
4	TEST	Apr 22, 2014 10:14 AM
5	Approx 0.5 deg by 0.5 deg	Apr 22, 2014 9:54 AM
6	0.1o	Apr 19, 2014 6:57 PM
7	TEST	Apr 17, 2014 4:25 PM
8	60km	Apr 17, 2014 3:21 PM
9	24 x 13 km	Apr 17, 2014 3:09 PM
10	2x2	Apr 15, 2014 1:04 AM
11	lon x lat	Apr 9, 2014 1:30 PM

**Page 10, Q1. Vertical range of data (with effective sensitivity) required for analysis:
(please specify the vertical range wherein meaningful information really contributed by the measurement is required)**

1	TEST	Apr 22, 2014 10:14 AM
2	TEST	Apr 17, 2014 4:25 PM
3	tropospheric columns are meaningful	Apr 9, 2014 1:31 PM

Page 10, Q2. Vertical resolution of data required for analysis:

1	TEST	Apr 22, 2014 10:14 AM
2	For different applications I need different vertical resolution / Dofs of profiles	Apr 19, 2014 12:54 PM
3	TEST	Apr 17, 2014 4:25 PM
4	significant levels (e.g., tropopause, inversions, etc)	Apr 16, 2014 5:37 PM

Page 11, Q1. Have you any requirements (and if so, what are they?) regarding the data you analyse in terms of:

Systematic uncertainty		
1	as low as possible	May 14, 2014 11:20 AM
2	Good knowledge of spatial and temporal uncertainty	May 11, 2014 11:40 AM
3	<1%	May 2, 2014 11:50 AM
4	5%	Apr 22, 2014 3:50 PM
6	none (observations are usually weighted by errors)	Apr 22, 2014 9:56 AM
7	Systematic uncertainty	Apr 22, 2014 4:55 AM
9	needs to be provided	Apr 17, 2014 3:12 PM
10	< 5%	Apr 17, 2014 1:43 PM
11	should be quantified	Apr 16, 2014 5:37 PM
12	10%	Apr 15, 2014 12:43 PM
14	<25%	Apr 9, 2014 1:32 PM
15	0.5K	Apr 9, 2014 12:57 PM
16	< 5-8%	Apr 9, 2014 12:08 PM
Random uncertainty		
2	Same as above	May 11, 2014 11:40 AM
3	<0.5%	May 2, 2014 11:50 AM
4	5%	Apr 22, 2014 3:50 PM
6	none observations are usually weighted by errors)	Apr 22, 2014 9:56 AM
7	Random uncertainty	Apr 22, 2014 4:55 AM
9	needs to be provided	Apr 17, 2014 3:12 PM
10	10%	Apr 17, 2014 1:43 PM
11	should be quantified	Apr 16, 2014 5:37 PM
12	10%	Apr 15, 2014 12:43 PM
14	±20%	Apr 9, 2014 1:32 PM
15	0.5K	Apr 9, 2014 12:57 PM
16	< 5-8%	Apr 9, 2014 12:08 PM
Long-term stability of data record		
1	stability is required	May 14, 2014 11:20 AM

Page 11, Q1. Have you any requirements (and if so, what are they?) regarding the data you analyse in terms of:

2	yes	May 11, 2014 11:40 AM
4	1% per year	Apr 22, 2014 3:50 PM
6	Is critical else ad hoc corrections have to be performed	Apr 22, 2014 9:56 AM
7	Long-term stability of data record	Apr 22, 2014 4:55 AM
9	required	Apr 17, 2014 3:12 PM
10	5%	Apr 17, 2014 1:43 PM
11	most important	Apr 16, 2014 5:37 PM
14	better than a few percent	Apr 9, 2014 1:32 PM
16	< 3% per decade	Apr 9, 2014 12:08 PM
Dependence on solar zenith angle		
1	if so, should be documented	May 14, 2014 11:20 AM
2	yes	May 11, 2014 11:40 AM
6	typically less than 60 deg	Apr 22, 2014 9:56 AM
7	Dependence on solar zenith angle	Apr 22, 2014 4:55 AM
9	needs to be provided	Apr 17, 2014 3:12 PM
10	< 5%	Apr 17, 2014 1:43 PM
Dependence on ground albedo		
4	yes	Apr 22, 2014 3:50 PM
6	none	Apr 22, 2014 9:56 AM
7	Dependence on ground albedo	Apr 22, 2014 4:55 AM
10	< 5%	Apr 17, 2014 1:43 PM
Dependence on surface thermal emissivity		
6	n/a	Apr 22, 2014 9:56 AM
10	< 5%	Apr 17, 2014 1:43 PM
15	yes - as low as possible	Apr 9, 2014 12:57 PM
Dependence on atmospheric temperature (weighted profile)		
2	yes	May 11, 2014 11:40 AM
6	n/a	Apr 22, 2014 9:56 AM
9	needs to be provided	Apr 17, 2014 3:12 PM

Page 11, Q1. Have you any requirements (and if so, what are they?) regarding the data you analyse in terms of:

10	< 5%	Apr 17, 2014 1:43 PM
Dependence on cloud cover, cloud height, cloud optical thickness		
1	if so, should be documented	May 14, 2014 11:20 AM
2	yes	May 11, 2014 11:40 AM
4	yes	Apr 22, 2014 3:50 PM
6	cloud fraction less than 40%	Apr 22, 2014 9:56 AM
7	Dependence on cloud cover, cloud height, cloud optical thickness	Apr 22, 2014 4:55 AM
9	needs to be provided	Apr 17, 2014 3:12 PM
10	< 5%	Apr 17, 2014 1:43 PM
11	important	Apr 16, 2014 5:37 PM
Other		
5	TEST	Apr 22, 2014 10:14 AM
8	TEST	Apr 17, 2014 4:25 PM
10	< 5%	Apr 17, 2014 1:43 PM
13	I understand that this is closely related to the technologies available today. The smaller, the better, of course	Apr 15, 2014 2:07 AM
14	The above dependences will be there, but should be accounted for in the retrieval (in order to minimize their impact on the final product).	Apr 9, 2014 1:32 PM
15	lowest dependence on aerosols	Apr 9, 2014 12:57 PM

Page 14, Q1. As you answered yes to the previous question, please explain how you would use this information.

1	To examine likely causes of uncertainty in the data due to processing methods and assumptions	May 11, 2014 11:41 AM
2	for quality and confidence limit	Apr 23, 2014 6:54 PM
3	For technical processing of the data documents such as Product Format Specification and Data User Guidelines are imperative. This allows the data to be read correctly and interpreted properly.	Apr 22, 2014 10:49 AM
4	Transparency is key. It is not always clear in some retrievals of the EXACT steps that have occurred. As we push for ever increasing accuracy small details become important. Knowledge of how a retrieval is done allows one to better estimate errors and also improve the retrieval (e.g. in the AMF calculation) where possible.	Apr 22, 2014 9:59 AM
5	I would do error assessment of my own	Apr 22, 2014 9:11 AM
6	I would like to read a technique document specifying the retrieval and uncertainty step by step. The current ATBD document is fine, but it could include more detailed analysis and more frequent updates.	Apr 22, 2014 4:59 AM
7	for information	Apr 19, 2014 6:57 PM
8	To identify when and where the data are valid for my application. For instance, what are the uncertainties of the data and are they bigger than the signal that I'm trying to determine from the data.	Apr 17, 2014 10:00 PM
9	TEST	Apr 17, 2014 4:25 PM
10	to check validity of data	Apr 17, 2014 3:23 PM
11	consider uncertainties in analysis	Apr 17, 2014 3:13 PM
12	To look for processing methods for outlier signals.	Apr 17, 2014 2:37 PM
13	For understanding observational uncertainties	Apr 17, 2014 2:03 PM
14	to investigate possible time-varying biases in long-term records	Apr 16, 2014 5:38 PM
15	To evaluate the data used.	Apr 15, 2014 12:43 PM
16	for publication purposes	Apr 15, 2014 10:51 AM
17	To understand the data product	Apr 15, 2014 2:08 AM
18	To better understand the data and potential problems in them	Apr 14, 2014 5:24 PM
19	Better understanding of data product	Apr 9, 2014 12:10 PM
20	verify the product, at the extreme produce a new version	Apr 9, 2014 11:53 AM

Page 15, Q1. As you answered yes to the previous question, please explain where you obtain this information.

1	from the people doing the retrieval (in the same institute where I work)	May 14, 2014 11:21 AM
2	Usually from the ATBD	Apr 30, 2014 8:03 AM
3	Manuals available through the major data download sites.	Apr 29, 2014 10:31 AM
4	Technical documentation posted on web site of the data provider	Apr 22, 2014 3:52 PM
5	test	Apr 22, 2014 10:18 AM
6	From email, community	Apr 22, 2014 8:59 AM
7	ATBDs	Apr 19, 2014 12:55 PM
8	NASA DAACs	Apr 17, 2014 8:20 PM
9	TEST	Apr 17, 2014 4:24 PM
10	Averaging kernel, prior, etc.	Apr 17, 2014 2:31 PM
11	Instrument websites and/or data respositories	Apr 17, 2014 2:31 PM
12	from colleagues at KNMI for OMI. Also, I reprocess the data myself to insure I understand.	Apr 17, 2014 2:27 PM
13	scientific papers	Apr 17, 2014 1:43 PM
14	Homepage of satellites/instruments, ATBD documentation, publications	Apr 17, 2014 8:28 AM
15	From the product specification document and various publications.	Apr 9, 2014 1:33 PM
16	ATBD and scientific papers	Apr 9, 2014 12:58 PM
17	in the atbd	Apr 9, 2014 11:11 AM

Page 19, Q1. How is the uncertainty information provided? (e.g. per pixel, by scene etc)

1	per pixel	May 14, 2014 11:23 AM
2	per pixel	May 11, 2014 11:43 AM
3	per pixel	May 2, 2014 11:52 AM
4	per pixel	Apr 30, 2014 8:04 AM
5	per column or per profile level	Apr 29, 2014 10:33 AM
6	scene, region	Apr 23, 2014 6:56 PM
7	per data value (i.e. per retrieval level of each retrieved profile, as we use limb-scanning instruments; equivalent to "per pixel" for nadir-scanning instruments)	Apr 22, 2014 3:54 PM
8	For satellite products, usually per pixel.	Apr 22, 2014 10:52 AM
9	TEST	Apr 22, 2014 10:38 AM
10	Yes, per pixel, the error of VCD	Apr 22, 2014 9:05 AM
11	per pixel	Apr 22, 2014 5:00 AM
12	per pixel	Apr 19, 2014 12:56 PM
13	per pixel, for each vertical layer reported	Apr 17, 2014 8:22 PM
14	TEST	Apr 17, 2014 4:24 PM
15	standard deviation of data from mean	Apr 17, 2014 3:28 PM
16	per pixel	Apr 17, 2014 2:39 PM
17	per retrieval	Apr 17, 2014 2:32 PM
18	Per pixel	Apr 17, 2014 2:31 PM
19	pixel	Apr 17, 2014 2:28 PM
20	in the product	Apr 17, 2014 1:45 PM
21	per pixel/observation	Apr 17, 2014 8:30 AM
22	not sure	Apr 16, 2014 5:39 PM
23	uncertainty by wavelength	Apr 15, 2014 2:22 PM
24	A number per measurement,	Apr 15, 2014 12:44 PM
25	per pixel	Apr 14, 2014 5:25 PM
26	per pixel	Apr 9, 2014 1:34 PM
27	Per single measurement	Apr 9, 2014 12:14 PM
28	per pixel	Apr 9, 2014 11:11 AM

Page 19, Q2. How is the uncertainty value provided? (e.g. %, in product units, etc.)

1	in product units	May 14, 2014 11:23 AM
2	for some products percentages and others product units	May 11, 2014 11:43 AM
3	product units	May 2, 2014 11:52 AM
4	in product using	Apr 30, 2014 8:04 AM
5	in % or in product units	Apr 29, 2014 10:33 AM
6	%	Apr 23, 2014 6:56 PM
7	product units	Apr 22, 2014 3:54 PM
8	Either in product units or as %; varies across different products.	Apr 22, 2014 10:52 AM
9	TEST	Apr 22, 2014 10:38 AM
10	from some procents up to more than 50 %	Apr 22, 2014 9:05 AM
11	in product units	Apr 22, 2014 5:00 AM
12	absolute	Apr 19, 2014 12:56 PM
13	product units	Apr 17, 2014 8:22 PM
14	TEST	Apr 17, 2014 4:24 PM
15	% error	Apr 17, 2014 3:28 PM
16	product units	Apr 17, 2014 2:39 PM
17	product units	Apr 17, 2014 2:32 PM
18	depending on the product in % or product units	Apr 17, 2014 2:31 PM
19	as a flag	Apr 17, 2014 2:28 PM
20	absolute units	Apr 17, 2014 1:45 PM
21	product units	Apr 17, 2014 8:30 AM
22	not sure	Apr 16, 2014 5:39 PM
23	in %	Apr 15, 2014 2:22 PM
24	Product units	Apr 15, 2014 12:44 PM
25	% and absolute units	Apr 14, 2014 5:25 PM
26	molec./cm ²	Apr 9, 2014 1:34 PM
27	Product units or %	Apr 9, 2014 12:14 PM
28	product unit	Apr 9, 2014 11:11 AM

Page 19, Q3. How do you make use of them? (e.g. weighting, data assimilation etc.)

1	Bayesian inversion of sources	May 14, 2014 11:23 AM
2	to assess their usefulness in validation studies and for quality control/filtering	May 11, 2014 11:43 AM
3	filter criterion	May 2, 2014 11:52 AM
4	weighting	Apr 30, 2014 8:04 AM
5	comparison error budget analysis	Apr 29, 2014 10:33 AM
6	weighting, etc.	Apr 23, 2014 6:56 PM
7	data assimilation	Apr 22, 2014 3:54 PM
8	The uncertainty is taken into account in the data assimilation process.	Apr 22, 2014 10:52 AM
9	TEST	Apr 22, 2014 10:38 AM
10	different. some times weighting or as a relative value	Apr 22, 2014 9:05 AM
11	weighting	Apr 22, 2014 5:00 AM
12	weighting, threshold	Apr 19, 2014 12:56 PM
13	weighting, error propagation, data assimilation	Apr 17, 2014 8:22 PM
14	TEST	Apr 17, 2014 4:24 PM
15	to see if model data falls within observed data range	Apr 17, 2014 3:28 PM
16	anomaly identification	Apr 17, 2014 2:39 PM
17	data assimilation	Apr 17, 2014 2:32 PM
18	weighting, data assimilation	Apr 17, 2014 2:31 PM
19	I use quality flags and don't include certain flagged data in my analysis	Apr 17, 2014 2:28 PM
20	inverse modelling as measurement error	Apr 17, 2014 1:45 PM
21	data assimilation	Apr 17, 2014 8:30 AM
22	not sure	Apr 16, 2014 5:39 PM
23	satellite comparison with ground-based data/model data	Apr 15, 2014 2:22 PM
24	Evaluation; data assimilation	Apr 15, 2014 12:44 PM
25	by using only values below a certain threshold	Apr 14, 2014 5:25 PM
26	weighting & data assimilation	Apr 9, 2014 1:34 PM
27	Data screening Determination of statistical significance	Apr 9, 2014 12:14 PM
28	weighting	Apr 9, 2014 11:11 AM

Page 20, Q1. Why don't you make use of the uncertainty information?

1	Test	Apr 22, 2014 10:30 AM
2	TEST	Apr 17, 2014 4:24 PM
3	I do if available	Apr 17, 2014 3:16 PM
4	Model uncertainty is assumed larger	Apr 17, 2014 2:03 PM
5	I will use it in the near future. I am currently learning.	Apr 15, 2014 2:09 AM
6	because it is too vague	Apr 9, 2014 12:59 PM
7	difficult to use systematically	Apr 9, 2014 11:54 AM

Page 21, Q1. What uncertainty information would you want? (e.g. per pixel, per scene etc.)

1	TEST	Apr 22, 2014 10:32 AM
2	Per observation	Apr 22, 2014 10:00 AM
3	average	Apr 19, 2014 6:56 PM
4	Uncertainty beyond instrument uncertainty. I'd like much better validation of satellite data products with in situ observations.	Apr 17, 2014 10:02 PM
5	TEST	Apr 17, 2014 4:24 PM
6	per pixel	Apr 17, 2014 3:16 PM
7	not sure	Apr 17, 2014 2:04 PM
8	per measurement datum	Apr 15, 2014 2:10 AM
9	per pixel	Apr 9, 2014 12:59 PM
10	confidence index	Apr 9, 2014 11:55 AM

Page 21, Q2. How would you make use of this? (e.g. weighting, data assimilation, thresholding/masking etc.)

1	TEST	Apr 22, 2014 10:32 AM
2	All of the above (weighting, data assimilation, thresholding/masking)	Apr 22, 2014 10:00 AM
3	compare with model uncertainty	Apr 19, 2014 6:56 PM
4	To decide if the data are appropriate for my particular application.	Apr 17, 2014 10:02 PM
5	TEST	Apr 17, 2014 4:24 PM
6	include range in comparison to models	Apr 17, 2014 3:16 PM
7	weighting	Apr 17, 2014 2:04 PM
8	To understand the data product	Apr 15, 2014 2:10 AM
9	error propagation in further use of the data for other retrievals	Apr 9, 2014 12:59 PM
10	thresholding if necessary	Apr 9, 2014 11:55 AM

Page 24, Q1. As you answered yes to the previous question, please tell us how you make use of the quality flags? (e.g thresholding, masking etc)

1	masking	May 14, 2014 11:23 AM
2	to exclude unreliable data	May 11, 2014 11:44 AM
3	thresholding	May 2, 2014 11:53 AM
4	thresholding	Apr 30, 2014 8:05 AM
5	thresholding	Apr 29, 2014 10:33 AM
6	data analysis	Apr 23, 2014 6:57 PM
7	masking	Apr 22, 2014 3:55 PM
8	Make use of various types of quality flags in order to either filter out or flag as "bad" observations which do not meet certain quality criteria, usually specified in the Data User Guidelines (if available).	Apr 22, 2014 10:54 AM
9	TEST	Apr 22, 2014 10:41 AM
10	Data quality filtering (i.e. discarding/selecting bad observations)	Apr 22, 2014 10:01 AM
11	That makes usually sense to use that, but it seems, it is not absolutely fine.	Apr 22, 2014 9:05 AM
12	Sometimes I did my own data screening, and did sensitivity analysis	Apr 22, 2014 5:01 AM
13	masking	Apr 19, 2014 6:56 PM
14	It is important that the user can easily discriminate between important and more cosmetic flags without reading lengthy documents.	Apr 19, 2014 12:57 PM
15	removing questionable data, filtering for clouds, etc.	Apr 17, 2014 10:02 PM
16	masking	Apr 17, 2014 8:23 PM
17	test	Apr 17, 2014 4:23 PM
18	masking	Apr 17, 2014 3:17 PM
19	to assess the true meaning of low-quality data	Apr 17, 2014 2:39 PM
20	data filtering	Apr 17, 2014 2:32 PM
21	Filter (mask) data according to recommendations by data provider	Apr 17, 2014 2:32 PM
22	I don't use some flagged data	Apr 17, 2014 2:29 PM
23	masking	Apr 17, 2014 2:04 PM
24	on/off	Apr 17, 2014 1:45 PM
25	masking	Apr 17, 2014 8:30 AM
26	masking	Apr 16, 2014 5:40 PM
27	both thresholding and masking of data used for comparisons	Apr 15, 2014 2:23 PM

Page 24, Q1. As you answered yes to the previous question, please tell us how you make use of the quality flags? (e.g thresholding, masking etc)

28	Masking	Apr 15, 2014 12:44 PM
29	to remove it from the data analysis	Apr 15, 2014 2:11 AM
30	thresholding, masking	Apr 14, 2014 5:26 PM
31	rule out snow-covered data and data affected by striping (technical problems).	Apr 9, 2014 1:35 PM
32	masking	Apr 9, 2014 1:00 PM
33	Data screening	Apr 9, 2014 12:14 PM
34	masking	Apr 9, 2014 11:55 AM
35	removing flagged data	Apr 9, 2014 11:12 AM

Page 25, Q1. As you answered no to the previous question, please tell us why don't you utilise the information provided in the quality flags?

1	TEST	Apr 22, 2014 10:40 AM
2	I responded no to get through a loop in this survey. A quality flag is not the same as a measure of uncertainty thought this survey seems to think so!	Apr 17, 2014 3:29 PM

Page 27, Q1. As you answered no to the previous question, please explain why.

1	test	Apr 22, 2014 10:41 AM
2	That will be explained in future works.	Apr 22, 2014 9:05 AM
3	Systematic errors are not specified clearly. Uncertainty values are more or less empirical.	Apr 22, 2014 5:02 AM
4	inconsistency among various products	Apr 17, 2014 2:40 PM
5	OMI raw anomaly is not flagged properly for instance	Apr 9, 2014 11:12 AM

Page 28, Q1. What information would you like to see provided as a quality flag?

1	TEST	Apr 22, 2014 10:41 AM
2	systematic or random error	Apr 22, 2014 5:03 AM
3	TEST	Apr 17, 2014 4:23 PM

Page 29, Q1. What additional information would you like to see provided as a quality flag?

1	-	May 14, 2014 11:24 AM
2	Any other approximations or fudge factors used	Apr 22, 2014 10:02 AM
3	TEST	Apr 17, 2014 4:23 PM
4	Most of the above are already provided.	Apr 9, 2014 1:35 PM

Page 30, Q1. Do some of the products you use include any qualitative statement about their accuracy (closeness to truth)?

1	The people realizing the datasets we use are available for discussions on the dataset accuracy	May 14, 2014 11:27 AM
2	no	May 11, 2014 11:45 AM
3	yes, at least some validation reports are available	Apr 29, 2014 10:35 AM
4	no	Apr 22, 2014 3:56 PM
5	No.	Apr 22, 2014 10:56 AM
6	don't think so (off-hand)	Apr 22, 2014 10:03 AM
7	Yes and no. Errors are treated as random errors, while very often they are systematic biases.	Apr 22, 2014 5:04 AM
8	Occasionally, but the in situ observations are sparse, particularly for a range of atmospheric conditions and regions of the world.	Apr 17, 2014 10:04 PM
9	only in validation papers	Apr 17, 2014 8:24 PM
10	TEST	Apr 17, 2014 4:23 PM
11	not sure	Apr 17, 2014 3:18 PM
12	yes	Apr 17, 2014 2:41 PM
13	No	Apr 17, 2014 2:33 PM
14	Yes	Apr 17, 2014 2:33 PM
15	yes	Apr 17, 2014 2:06 PM
16	dont know	Apr 17, 2014 1:46 PM
17	no	Apr 17, 2014 8:31 AM
18	yes	Apr 16, 2014 5:41 PM
19	yes	Apr 15, 2014 2:24 PM
20	No	Apr 15, 2014 12:45 PM
21	no	Apr 15, 2014 2:12 AM
22	yes but very general	Apr 14, 2014 5:26 PM
23	Not in the product, but I know it's in the peer-reviewed literature.	Apr 9, 2014 1:36 PM
24	yes	Apr 9, 2014 1:02 PM
25	No	Apr 9, 2014 12:16 PM
26	no	Apr 9, 2014 11:13 AM

Page 30, Q2. Do some of the products you use include any information content diagnostics / analysis? (e.g. averaging kernels and covariance matrix, enabling examination of the meaningfulness of the data)

1	Yes, averaging kernels are included	May 14, 2014 11:27 AM
2	no	May 11, 2014 11:45 AM
3	averaging kernels	May 2, 2014 11:53 AM
4	yes	Apr 30, 2014 8:06 AM
5	yes, most do.	Apr 29, 2014 10:35 AM
6	yes	Apr 22, 2014 3:56 PM
7	Yes.	Apr 22, 2014 10:56 AM
8	Some but not all	Apr 22, 2014 10:03 AM
9	yes	Apr 22, 2014 5:04 AM
10	yes, scattering weights, averaging kernels	Apr 17, 2014 10:04 PM
11	yes	Apr 17, 2014 8:24 PM
12	TEST	Apr 17, 2014 4:23 PM
13	averaging kernel	Apr 17, 2014 3:18 PM
14	yes	Apr 17, 2014 2:41 PM
15	Yes	Apr 17, 2014 2:33 PM
16	Yes	Apr 17, 2014 2:33 PM
17	yes	Apr 17, 2014 2:06 PM
18	dont know	Apr 17, 2014 1:46 PM
19	yes	Apr 17, 2014 8:31 AM
20	don't know	Apr 16, 2014 5:41 PM
21	yes	Apr 15, 2014 2:24 PM
22	Some	Apr 15, 2014 12:45 PM
23	no	Apr 15, 2014 2:12 AM
24	yes	Apr 14, 2014 5:26 PM
25	Yes, the NO2 product I'm working with has averaging kernels, and ancillary info on clouds, albedo, etc.	Apr 9, 2014 1:36 PM
26	no	Apr 9, 2014 1:02 PM
27	Some contain vertical averaging kernels and/or covariance matrices	Apr 9, 2014 12:16 PM
28	no	Apr 9, 2014 11:13 AM

Page 31, Q1. Which other quality information supplied with the product you use do you find useful?

1	NA	Apr 29, 2014 10:35 AM
2	Retrieval successful or not.	Apr 22, 2014 11:00 AM
3	summary of comparison to in situ observations	Apr 17, 2014 10:05 PM
4	separate error contributions, e.g., smoothing, forward model, cross-state and measurement error terms	Apr 17, 2014 8:26 PM
5	TEST	Apr 17, 2014 4:22 PM
6	averaging kernel, standard deviations, instrumental error	Apr 17, 2014 3:18 PM
7	Assumed aerosol vertical distribution	Apr 17, 2014 2:34 PM
8	Degree of Freedom for Signal	Apr 17, 2014 2:34 PM
9	"super" quality flight	Apr 17, 2014 1:47 PM
10	spatial extend of measurements	Apr 15, 2014 2:25 PM

Page 31, Q2. Which other quality information NOT supplied with the product you use would you find useful?

1	NA	Apr 29, 2014 10:35 AM
2	Not all products include an estimate of the uncertainty of the retrieved quantity.	Apr 22, 2014 11:00 AM
3	who sets quality standards, how is it defined (does it vary in time for example)	Apr 22, 2014 10:04 AM
4	contributions of individual factors leading to the estimated error	Apr 22, 2014 5:05 AM
5	TEST	Apr 17, 2014 4:22 PM
6	Assumed aerosol microphysical properties	Apr 17, 2014 2:34 PM
7	dont know	Apr 17, 2014 1:47 PM
8	Perhaps the co-registered info on aerosol presence and type.	Apr 9, 2014 1:37 PM
9	one or two clear quality flags for the "basic user" so that it is not required to understand everything to use the product properly	Apr 9, 2014 1:03 PM
10	preflight calibration data base	Apr 9, 2014 11:57 AM

Page 34, Q1. By whom is (are) the product(s) validated?

1	Data suppliers and 3rd parties	May 2, 2014 11:55 AM
2	By experienced scientific teams	Apr 30, 2014 8:15 AM
3	us	Apr 29, 2014 10:38 AM
4	they are usually validated by the data providers through peer-reviewed publications and/or public project reports	Apr 22, 2014 3:59 PM
5	Normally the data providers have performed validation studies.	Apr 22, 2014 11:02 AM
6	Various studies	Apr 22, 2014 5:07 AM
7	Ground based measurements from various research groups	Apr 19, 2014 1:00 PM
8	aircraft and surface in situ data	Apr 17, 2014 8:26 PM
9	TEST	Apr 17, 2014 4:22 PM
10	Us! And other university researchers, NASA... lots of people, depending on the product (AOD, trace gas...)	Apr 17, 2014 2:35 PM
11	Most of the time the data providers themselves.	Apr 17, 2014 2:34 PM
12	The products are partially validated by a community of scientists in Europe and the US. There is a continual process of validation occurring.	Apr 17, 2014 2:31 PM
13	Product developers	Apr 17, 2014 2:07 PM
14	science team, written in papers	Apr 17, 2014 1:48 PM
15	instrument science teams	Apr 17, 2014 8:31 AM
16	Us; literature.	Apr 15, 2014 12:46 PM
17	in-situ balloon sounding data	Apr 15, 2014 2:13 AM
18	By independent researchers and by the team itself.	Apr 9, 2014 1:37 PM
19	Independent team that interact with Quality Working Group of data sets	Apr 9, 2014 12:17 PM
20	ESA	Apr 9, 2014 11:58 AM

Page 39, Q1. What do you think of the overall quality of the product validation documentation (completeness, intelligibility)?

1	validation not yet complete, documentation provided in open-access scientific articles	May 2, 2014 11:57 AM
2	Satisfactory	Apr 30, 2014 8:17 AM
3	good	Apr 29, 2014 10:40 AM
4	completeness sufficient; intelligibility could be improved	Apr 22, 2014 4:02 PM
5	fine	Apr 22, 2014 5:08 AM
6	-	Apr 19, 2014 1:01 PM
7	o.k.	Apr 17, 2014 8:28 PM
8	TEST	Apr 17, 2014 4:21 PM
9	-	Apr 17, 2014 2:36 PM
10	Sufficient	Apr 17, 2014 2:36 PM
11	the validation is spread over the scientific literature.	Apr 17, 2014 2:32 PM
12	OK	Apr 17, 2014 2:09 PM
13	ok	Apr 17, 2014 1:49 PM
14	not always easy to find for different retrieval versions	Apr 17, 2014 8:34 AM
15	Generally OK - succinctness is essential.	Apr 15, 2014 12:47 PM
16	reasonable	Apr 15, 2014 2:15 AM
17	Pretty good. Obviously more validation can be done, but independent reference data are scarce for tropospheric NO ₂ .	Apr 9, 2014 1:39 PM
18	In general of good quality. In some cases it is not clear for what atmospheric states the results are applicable.	Apr 9, 2014 12:40 PM

Page 39, Q2. What do you think about the validation approach used? (assumptions, scaling etc.)

1	validation still ongoing	May 2, 2014 11:57 AM
2	Is constantly improving	Apr 30, 2014 8:17 AM
3	sound, but limited by the quality of the reference data.	Apr 29, 2014 10:40 AM
4	Usually sufficient for our needs, but the validation approach is different for each product - this is a serious issue !	Apr 22, 2014 4:02 PM
5	some are better than the others	Apr 22, 2014 5:08 AM
6	-	Apr 19, 2014 1:01 PM
7	o.k., should include validation of retrieval uncertainties	Apr 17, 2014 8:28 PM
8	TEST	Apr 17, 2014 4:21 PM
9	-	Apr 17, 2014 2:36 PM
10	Basic validation if sufficient, sometimes additional/detailed validation focussing on specific issues know to exist from previous validation studies or use of data is lacking	Apr 17, 2014 2:36 PM
11	we are still learning how best to validate	Apr 17, 2014 2:32 PM
12	OK	Apr 17, 2014 2:09 PM
13	as always, very scattered	Apr 17, 2014 1:49 PM
14	there are limitations to all validation approaches but some is better than none at all	Apr 17, 2014 8:34 AM
15	Appropriate.	Apr 15, 2014 12:47 PM
16	reasonable	Apr 15, 2014 2:15 AM
17	Reasonable. Pixel representativity remains difficult.	Apr 9, 2014 1:39 PM
18	Good in general	Apr 9, 2014 12:40 PM

Page 39, Q3. What do you think about the quality/uncertainty of the reference data used to validate the product?

1	referecne data sets are good but not enough	May 2, 2014 11:57 AM
2	The quality of reference data is constantly improving	Apr 30, 2014 8:17 AM
3	In principle it is of reasonable quality, but global coverage should be improved	Apr 29, 2014 10:40 AM
4	the reference data is different for each product - this is a serious issue !	Apr 22, 2014 4:02 PM
5	some are better than the others	Apr 22, 2014 5:08 AM
6	-	Apr 19, 2014 1:01 PM
7	well documented	Apr 17, 2014 8:28 PM
8	TEST	Apr 17, 2014 4:21 PM
9	-	Apr 17, 2014 2:36 PM
10	Sufficient	Apr 17, 2014 2:36 PM
11	some of the reference data is sufficiently accurate and precise	Apr 17, 2014 2:32 PM
12	not sure if it covers all ranges of the observational space	Apr 17, 2014 2:09 PM
13	what is there is OK	Apr 17, 2014 1:49 PM
14	it is usually calibrated very precisely and is of good quality with well defined uncertainty although some care is required to determine how representative it is of the satellite observation.	Apr 17, 2014 8:34 AM
15	Appropriate.	Apr 15, 2014 12:47 PM
16	not yet fully satisfactory	Apr 15, 2014 2:15 AM
17	Comparable to the uncertainties quoted for the satellite retrieval.	Apr 9, 2014 1:39 PM
18	Good in general	Apr 9, 2014 12:40 PM

Page 41, Q1. As you answered yes to the previous question, please indicate how you conduct the product validation.

1	we compared 3d model outputs constrained by satellite data with aircraft campaigns for HCHO	May 14, 2014 11:30 AM
2	by comparison with a range of other similar products	May 11, 2014 11:46 AM
3	With own reference data, or by using network data	Apr 30, 2014 8:17 AM
4	comparison to reference measurements (ground-based); comparison to other similar products.	Apr 29, 2014 10:41 AM
5	The data can be passively monitored in our data assimilation system (I'm not the expert to give precise details).	Apr 22, 2014 11:04 AM
6	usually with whatever measurements (aircraft) are available - which isn't much	Apr 22, 2014 10:05 AM
7	comparison with MAX-DOAS data. independent estimate of overall errors regardless of the uncertainty flag - often to increase uncertainties. This is particularly considering the potential systematic biases	Apr 22, 2014 5:10 AM
8	Satellite measurements vs. MAXDOAS	Apr 19, 2014 1:02 PM
9	comparison of OMI NO2 to surface NO2 data	Apr 17, 2014 10:06 PM
10	additional comparisons with in situ, other satellite data and models	Apr 17, 2014 8:29 PM
11	TEST	Apr 17, 2014 4:21 PM
12	inter-data-set comparison	Apr 17, 2014 2:43 PM
13	Coordinated field campaigns with aircraft, in situ measurements.	Apr 17, 2014 2:37 PM
14	Sometimes additional validation is performed using validation data not used in known/published validation reports/papers.	Apr 17, 2014 2:36 PM
15	comparison to surface and aircraft data in the region of interest	Apr 17, 2014 2:32 PM
16	E.g., using data assimilation.	Apr 15, 2014 12:47 PM
17	I have my own balloon measurement data	Apr 15, 2014 2:15 AM
18	comparison between different products, comparison between different sensors, comparison with independent measurement where available	Apr 14, 2014 5:28 PM
19	Various ways: with aircraft profiles, in situ surface measurements, and balloons.	Apr 9, 2014 1:39 PM
20	Statistical comparison to reference data	Apr 9, 2014 12:40 PM