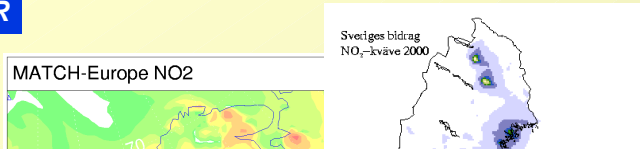


Contributions to hourly concentrations of PM10, NO2, CO and benzene:

1. Europe outside Sweden (44 x 44 km)
2. Sweden long range transport (11 x 11 km)
3. Urban background (1 x 1 km)
4. Local
 - a) street canyon
 - b) open road



Contributions to hourly concentrations of PM10, NO2, CO and benzene:

Microsoft Excel - Utskrift_ex

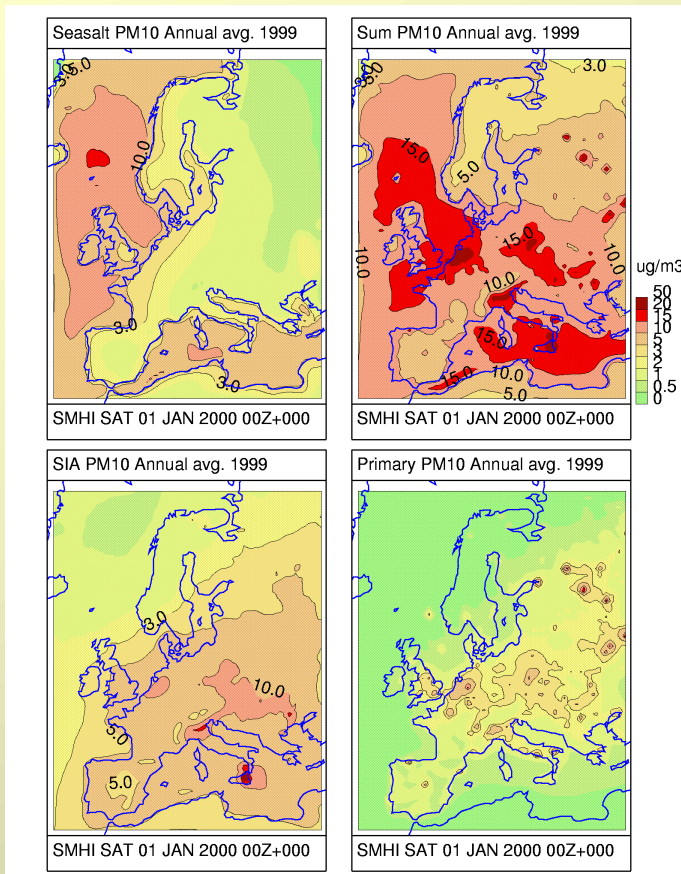
	A	B	C	D	E	F	G	H
		Trafik	PM10 Emissioner	PM10 RB- Utland	PM10 RB- Övriga Sverige	PM10 UB Linköpin g	LB Lokalt bidrag	TOTAL-HALT PM10
1								
2	2003-04-05 00:00	392	23.58	13.73	7.81	6.50	3.98	32.01
3	2003-04-05 01:00	135	20.75	11.71	5.79	4.09	1.90	23.49
4	2003-04-05 02:00	108	27.96	7.32	4.74	3.91	1.94	17.92
5	2003-04-05 03:00	87	32.29	7.06	49.86	3.68	2.08	62.68
6	2003-04-05 04:00	344	26.23	4.40	3.58	3.95	2.13	14.06
7	2003-04-05 05:00	1762	11.17	7.04	4.52	4.08	2.03	17.67
8	2003-04-05 06:00	3732	18.69	24.60	12.80	9.05	3.37	49.81
9	2003-04-05 07:00	5116	31.36	21.25	60.92	23.28	4.09	109.55
10	2003-04-05 08:00	4347	34.19	6.52	5.76	17.52	4.63	34.42
11	2003-04-05 09:00	3088	27.30	10.66	17.51	9.79	2.83	40.79
12	2003-04-05 10:00	2411	23.00	20.27	28.85	8.77	2.17	60.07
13	2003-04-05 11:00	2277	14.44	29.37	35.28	6.81	1.37	72.83
14	2003-04-05 12:00	2577	8.85	44.82	13.16	9.50		67.49
15	2003-04-05 13:00	2700	8.01	29.90	19.14	33.75	4.86	87.66
16	2003-04-05 14:00	2957	5.80	69.16	29.45	24.06	12.22	126.89
17	2003-04-05 15:00	3492	6.10	26.53	21.82	27.30	11.38	74.49
18	2003-04-05 16:00	4817	11.05	45.54	27.92	27.30	11.38	106.53
19	2003-04-05 17:00	4625	12.90	35.41	38.70	37.88	12.44	124.42
20	2003-04-05 18:00	3216	11.37	19.65	15.17	25.23	8.35	68.40
21	2003-04-05 19:00	2027	9.70	11.69	9.97	18.96	7.24	47.86

Output example

eden
transport

Current projects involving aerosol modelling

- **SIMAIR**
- **Development of an emission model for non-exhaust PM10**
(VV, collaboration with Stockholm municipality and SU/ITM, 2003-2004)
- **PASTA - Particle number concentrations as input to health assessment**
(3 years of daily averages, 500x500 m Stockholm, 2003-2004)



MATCH-PM

**PM10 source contributions
annual avg. 1999**

Evaluation of the EMEP Unified Model in relation to measurements and other models

- **EURODELTA - regional model inter-comparison**
 - Six European scale models
 - One base case (1999) and seven scenarios for 2010 including source-receptor calculations for Germany will be evaluated
 - Hosted by JRC-Ispra
- **TNO-EMEP - Regional model inter-comparison for three different years**
 - Same models as above
 - Comparison to observations for three years, 1999 and 2001
 - Hosted by TNO-MEP

ASTA - National and international abatement strategies for transboundary air pollution (MISTRA-programme, co-ordinated by IVL, 2003-2005)

NEPAP - Network for the support of European Policies on Air Pollution (EU, co-ordinated by IVL, 2003-2005)

Framework for modelling of the atmospheric aerosol

<i>Mode</i>	<i>Diam. Range (nm)</i>	<i>Sulfate Nitrate Ammonium</i>	<i>Organic Carbon</i>	<i>Elemental Carbon</i>	<i>Sea salt</i>	<i>Soil Dust</i>
Aitken	20 – 100	X		X	X	X
Accumulation1	100 - 1000	X		X	X	X
Accumulation2	1000 - 2500	X		X	X	X
Coarse	>2500	X		X	X	X

- Treatment of number and mass with 4 monodisperse modes requires 32 prognostic equations (MONO32) for the PM-part
- Sulfate, nitrate, ammonium, seasalt, primary anthropogenic PM is implemented
- Deposition and coagulation following MONO32 tested on urban scale. On the regional scale only deposition and condensation are taken into account.
- Future:
 - Separation of "fresh" and "cloud processed" particles.
 - Coagulation to be included.

1995, EUROTRAC-2/GLOREAM Aerosol intercomparison

Hass et al. (2003) EUROTRAC-2 Special Report

SO₂, April - September, N=49

	LOT OS	REM 3	EURAD / FFA	EUR OS	DEM	SMHI
aver(model)/aver(meas)	1.03	1.45	1.98	1.42	0.79	0.98
residue	2.77	2.68	4.90	3.61	2.51	2.56
RMSE	3.89	3.50	6.51	4.69	3.68	3.63
rho	0.32	0.34	0.32	0.30	0.36	0.38
% within fac 2	46.43	44.88	35.99	38.58	44.15	52.05

SO₄, April - September, N=55

	LOT OS	REM 3	EURAD / FFA	EUR OS	DEM	SMHI
aver(model)/aver(meas)	0.86	0.80	1.47	1.03	1.04	0.83
residue	1.97	1.98	3.04	2.90	3.13	1.84
RMSE	3.14	3.23	4.40	4.68	5.87	2.89
rho	0.49	0.49	0.48	0.44	0.34	0.61
% within fac 2	61.63	59.65	52.60	40.21	39.57	60.85

TNH₄, April - September, N=25

	LOT OS	REM 3	EURAD / FFA	EUR OS	DEM	SMHI
aver(model)/aver(meas)	0.76	1.12	1.62		1.88	0.93
residue	1.09	1.52	1.72		2.58	1.18
RMSE	1.61	2.07	2.26		3.88	1.64
rho	0.42	0.28	0.46		0.42	0.51
% within fac 2	61.98	53.48	51.13		41.11	60.44

TNO₃, April - September, N=20

	LOT OS	REM3	EURAD / FFA	EUR OS	DEM	SMHI
aver(model)/aver(meas)	1.70	1.20	2.89	2.68	1.29	0.99
residue	1.78	1.42	4.09	3.52	1.73	1.16
RMSE	2.52	2.13	5.27	4.77	2.72	1.76
rho	0.39	0.38	0.41	0.37	0.41	0.48
% within fac 2	50.16	59.06	47.62	36.89	42.51	57.77

NB: the LOTOS concept results into underestimation in case of strong emissions, here of ammonia and hence of TNH₄.