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Supplement of

A new chemistry option in WRF/Chem v. 3.4 for the simulation of direct and indirect aerosol effects using VBS: evaluation against IMPACT-EUCAARI data

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Table S1. ATR-42 flight during the EUCAARI campaign from 14 to 31 May 2008. In the Table are reported the date of the flight, flight number and take-off and landing time.

Date	RF number	Take-off and landing time(UCT)
14-05-2008	50	12:13-15:05
15-05-2008	51	06:19-09:50
15-05-2008	52	11:49-15:06
18-05-2008	53	08:50-11.10
18-05-2008	54	12:01-14:45
19-05-2008	55	11:06-14:24
20-05-2008	56	09:02-11:06
21-05-2008	57	10:07-12:06
21-05-2008	58	13:45-15:14
26-05-2008	59	11:59-15:20
28-05-2008	60	07:54-09:55
28-05-2008	61	13:24-15:40
29-05-2008	62	13:15-14:36
30-05-2008	63	11:26-14:42

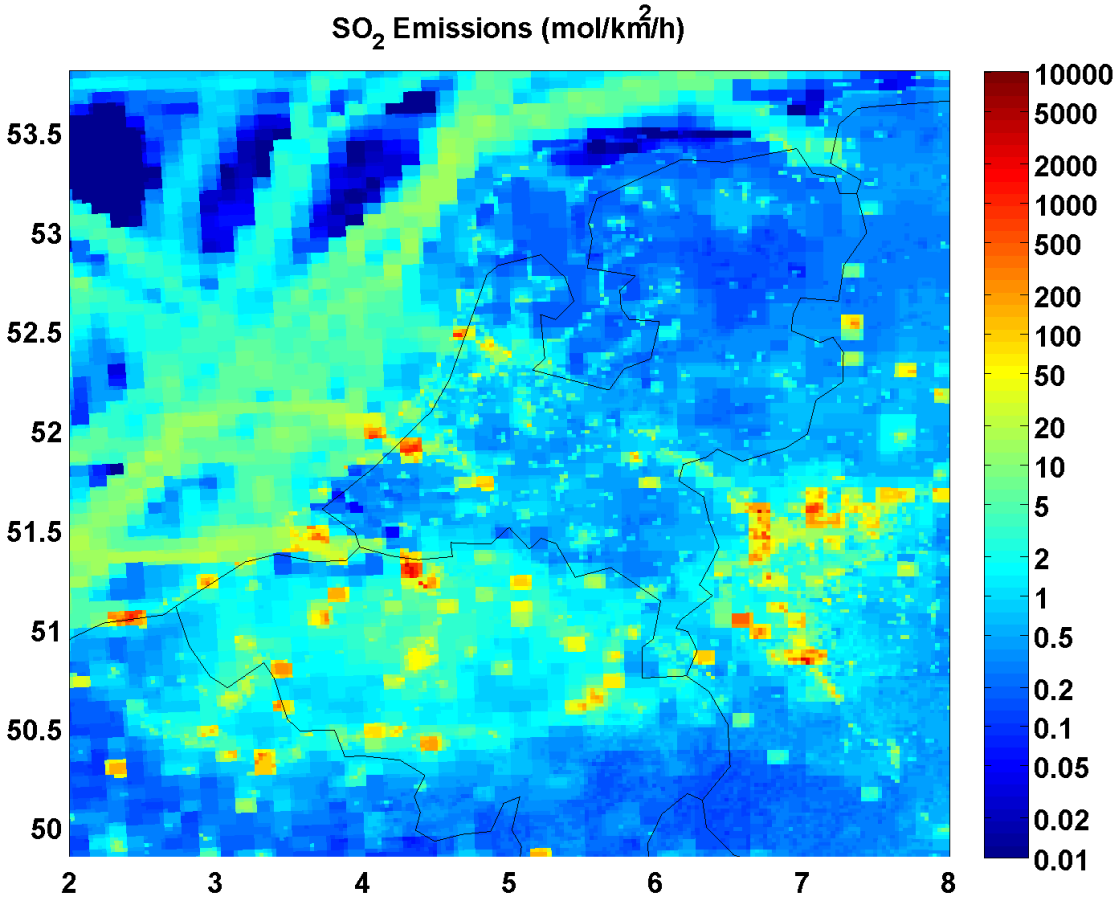

Figure S1. Diurnal average of weekday SO_2 emissions used in the model in domain D3.

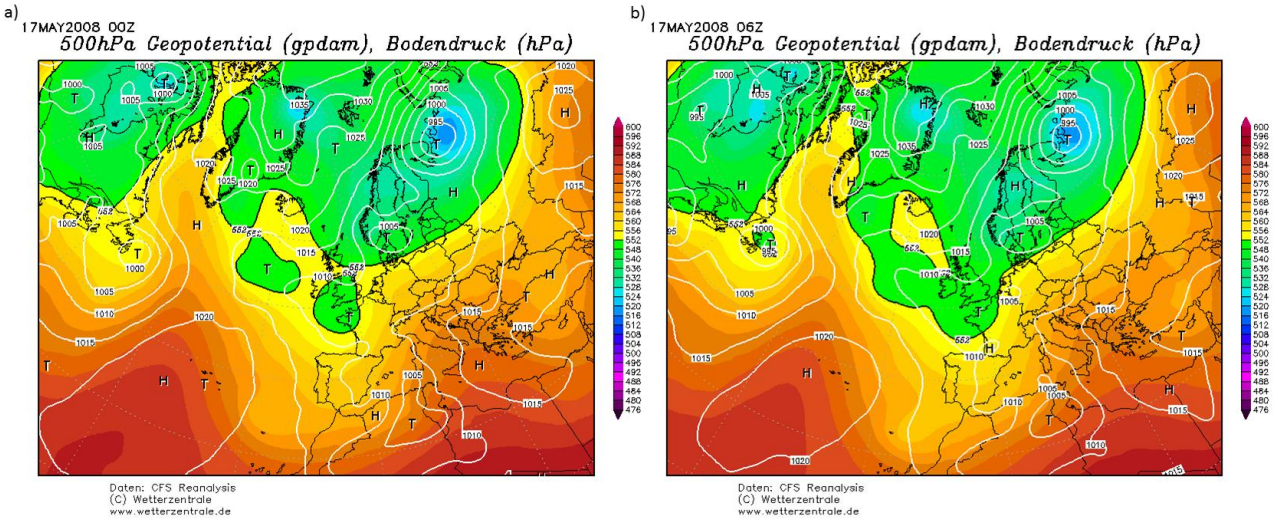

Figure S1. 500 hPa geopotential height (colors) and sea level pressure (white line) from Climate System Forecast reanalysis on 17 May 2008 at 00 (a) and 06 (b) UTC.

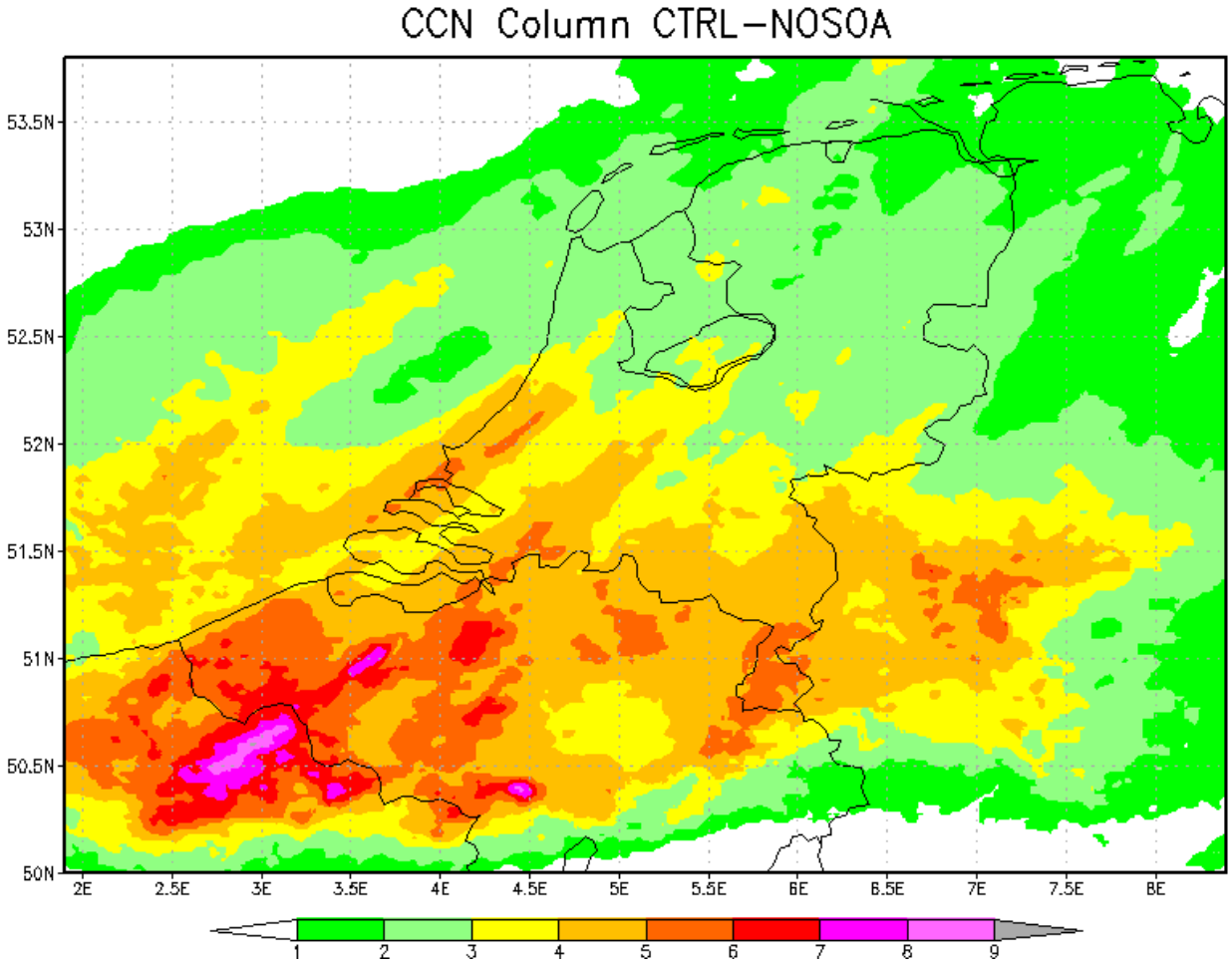

Figure S3. 24-hour average of cloud condensation nuclei column difference between the simulation with and without secondary organic aerosols (CTRL-NOSOA) on 17 May 2008. The units are in particles /m^2.

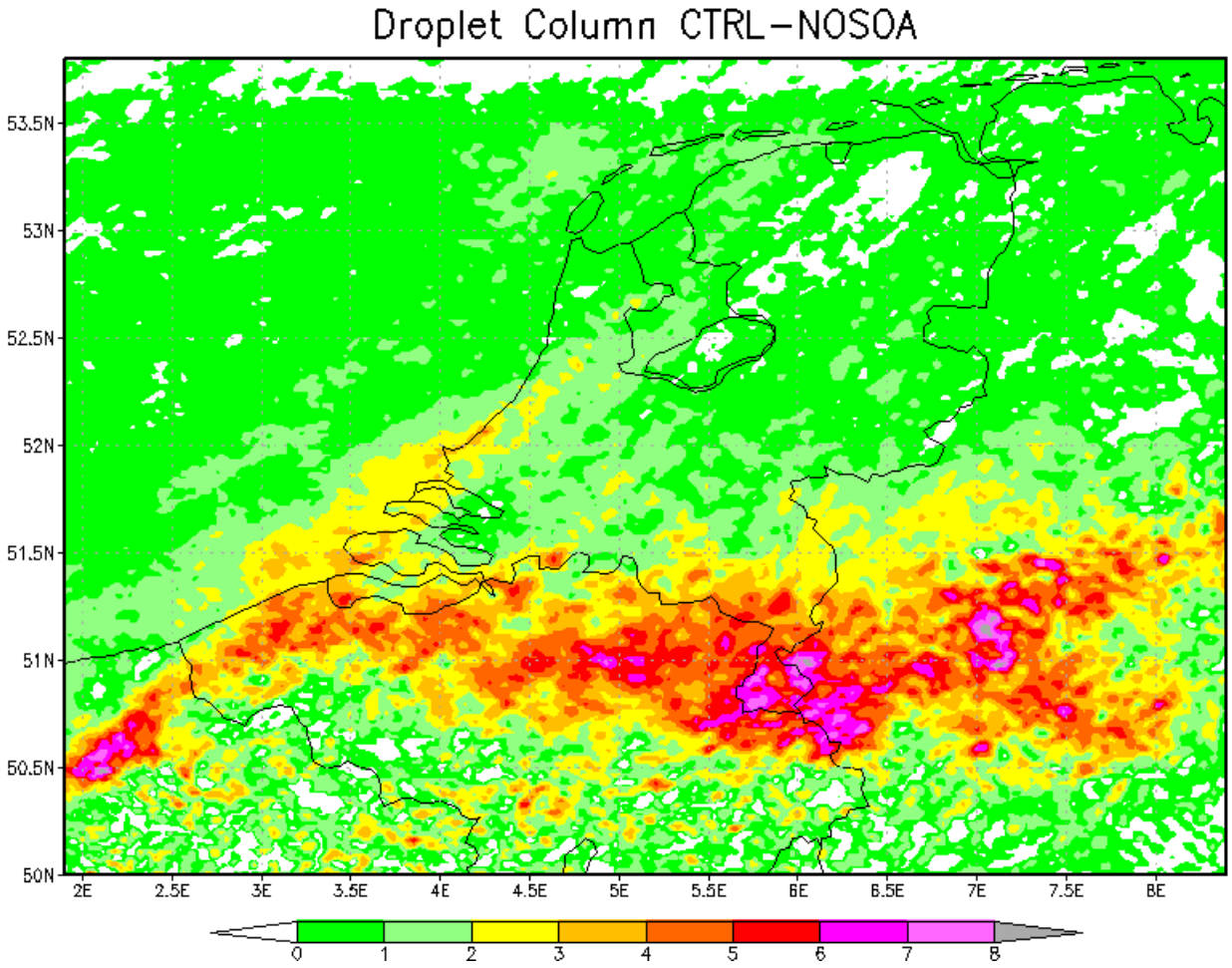

Figure S4. 24-hour average of cloud droplet number column difference between the simulation with and without secondary organic aerosols (CTRL-NOSOA) on 17 May 2008. The units are in particles /m^2.

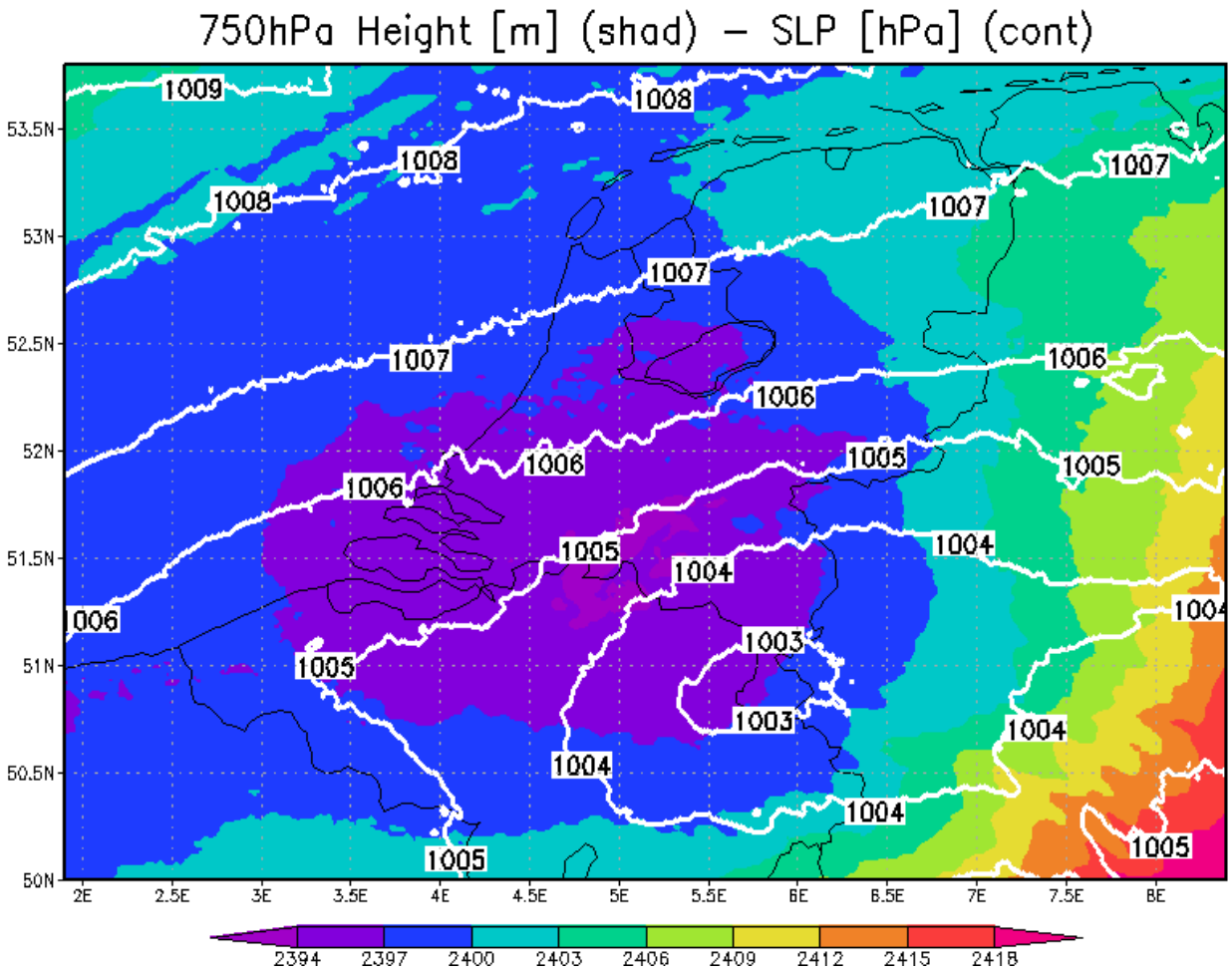

Figure S5. 750 hPa geopotential height (colors) and sea level pressure (white line) simulated by WRF/Chem on 17 May 2008 at 06 UTC.

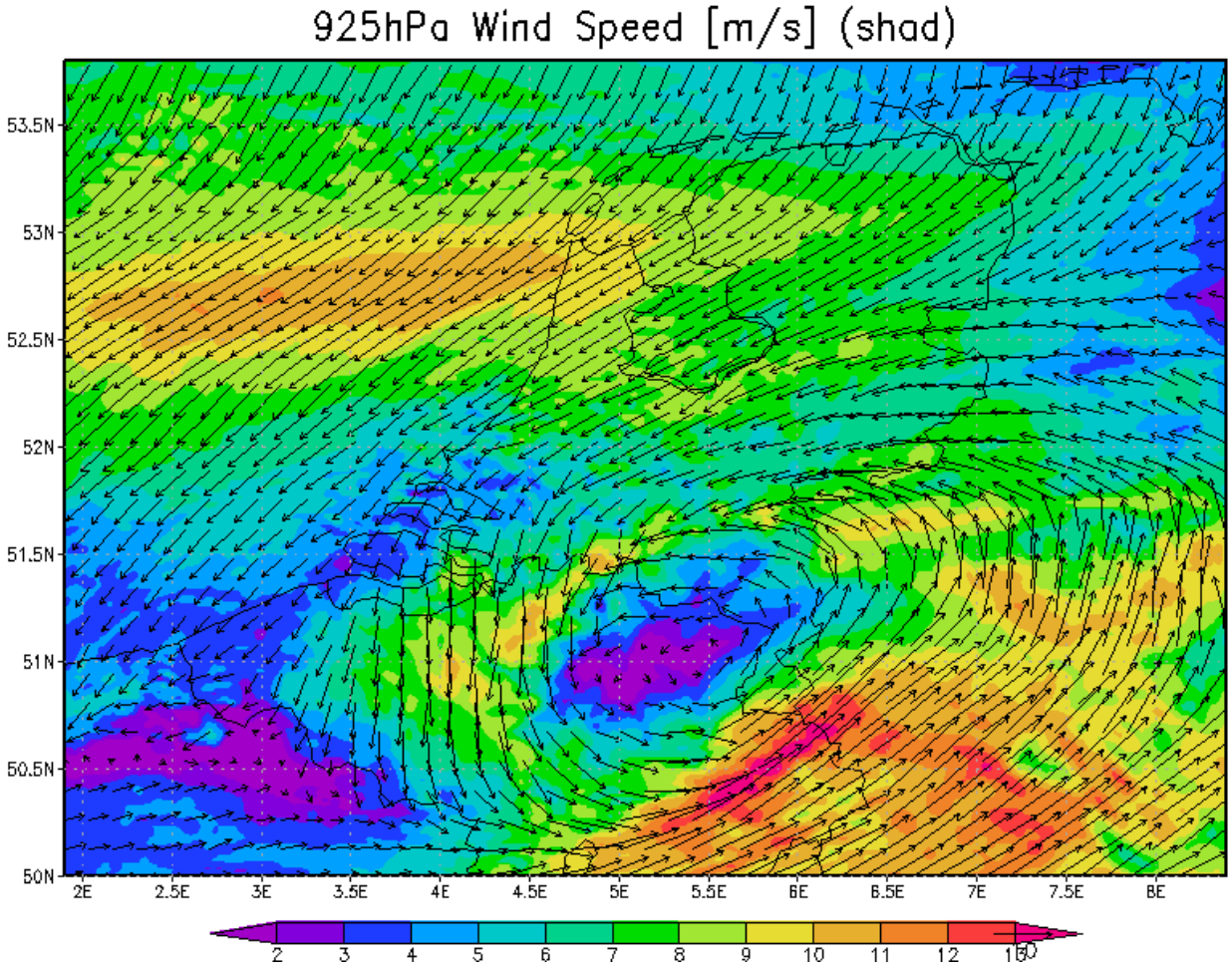

Figure S6. 925 hPa wind speed and direction simulated by WRF/Chem on 17 May 2008 at 06 UTC.