

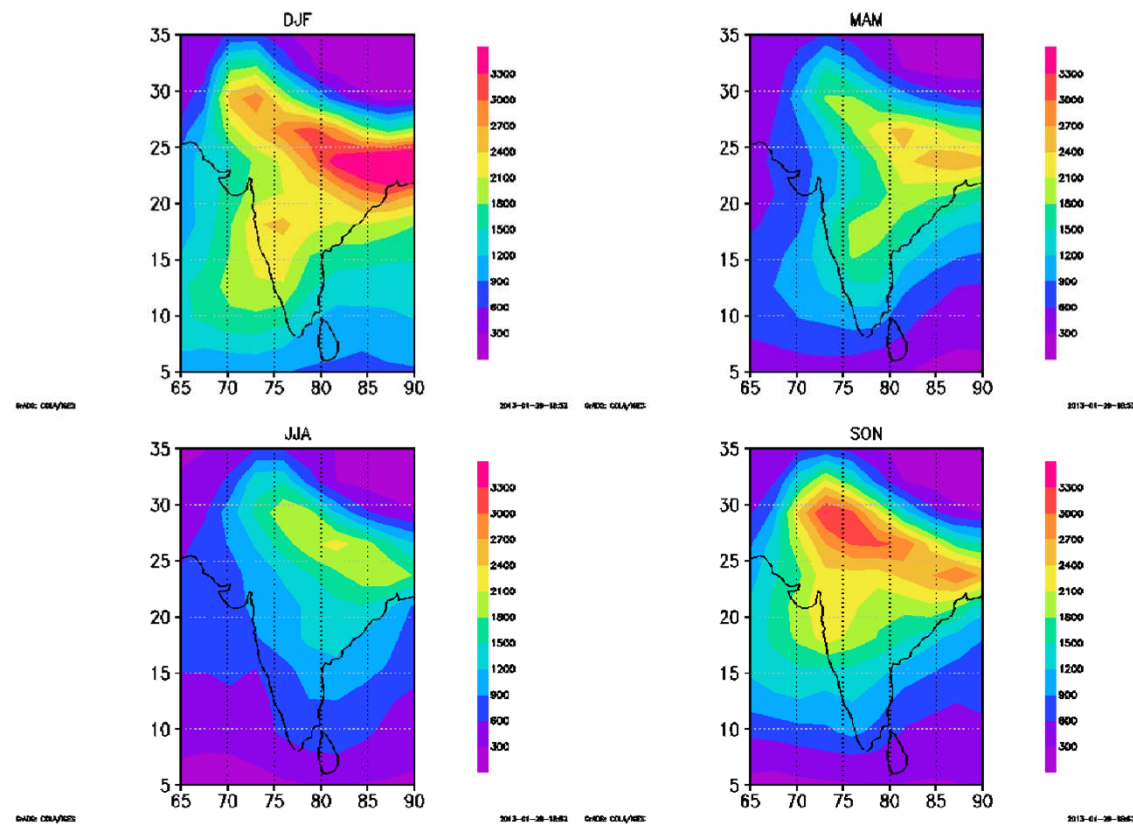


Supplement of

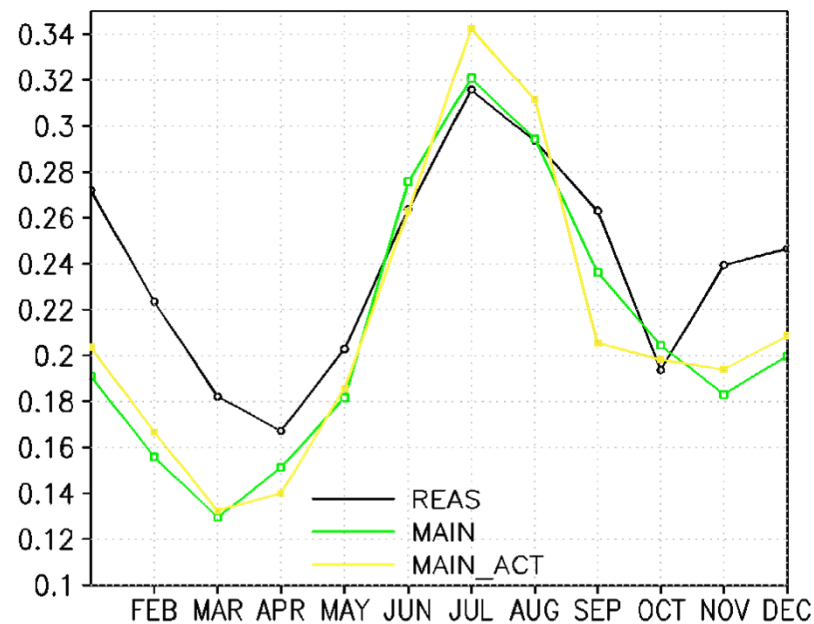
Spatial distributions and seasonal cycles of aerosol climate effects in India seen in a global climate–aerosol model

S. V. Henriksson et al.

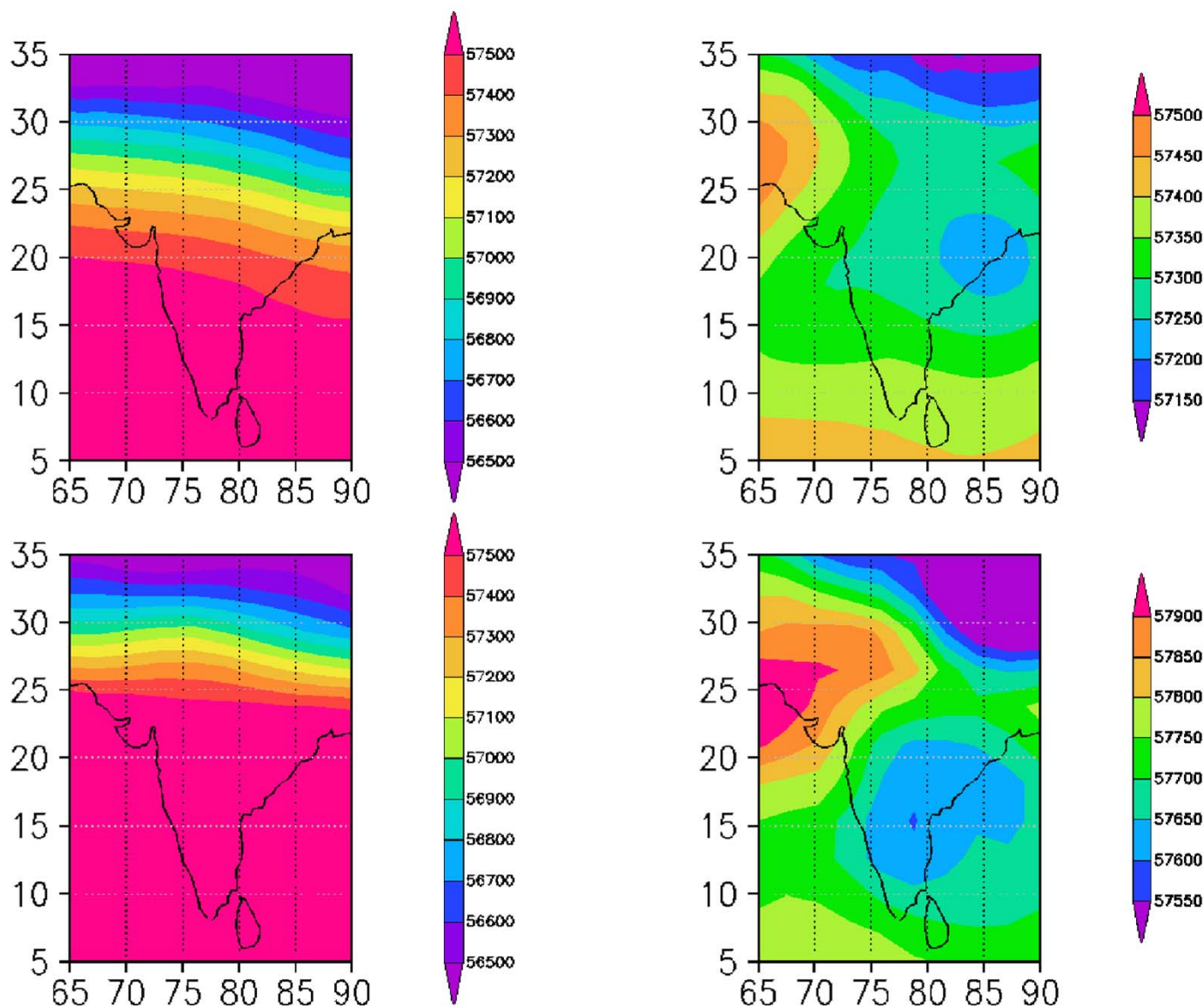
Correspondence to: S. V. Henriksson (svante.henriksson@fmi.fi)



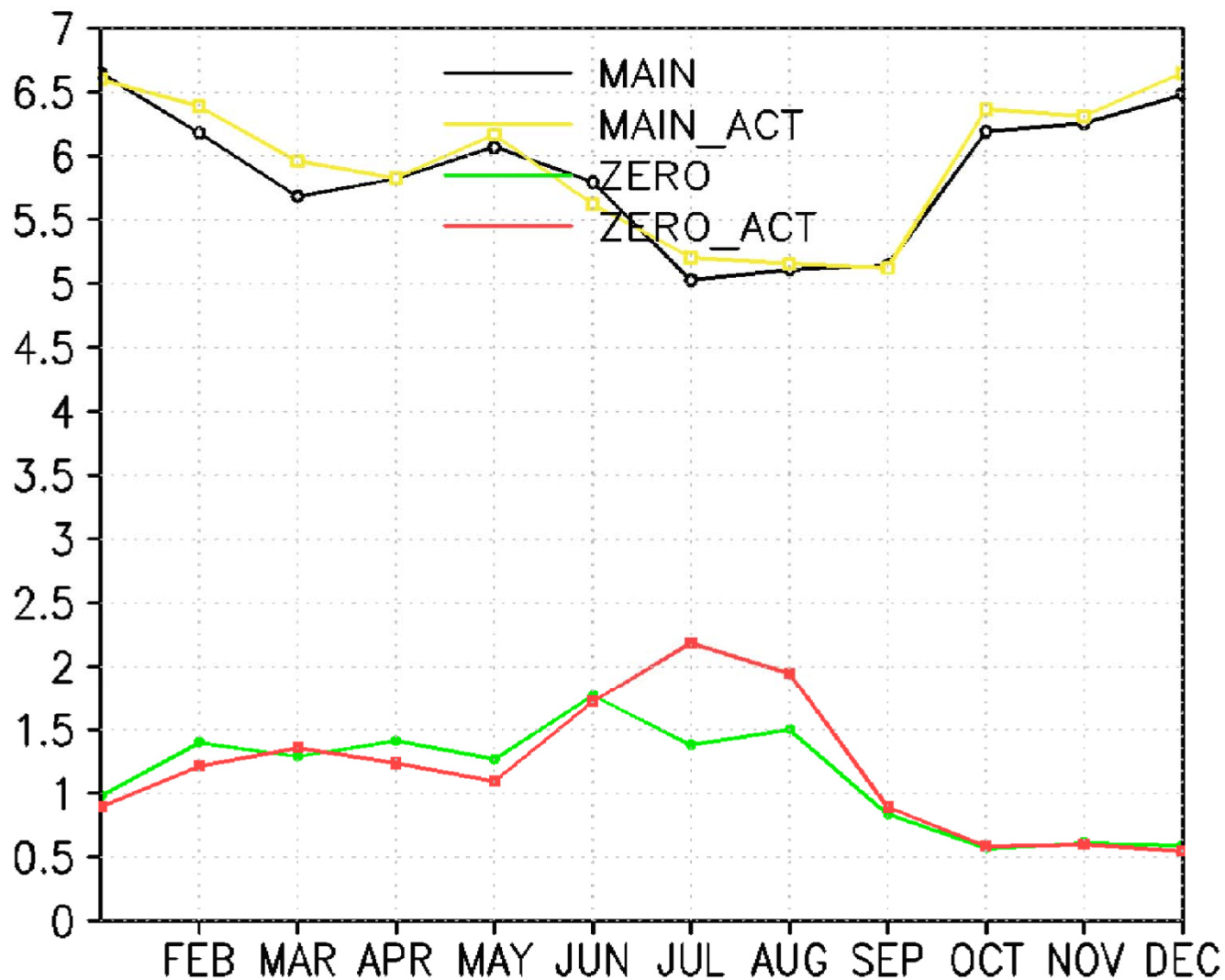
Supplementary Figure S1a.
Columnar BC burden
(in $\mu\text{g} / \text{m}^2$) in
MAIN simulation
during
different seasons.



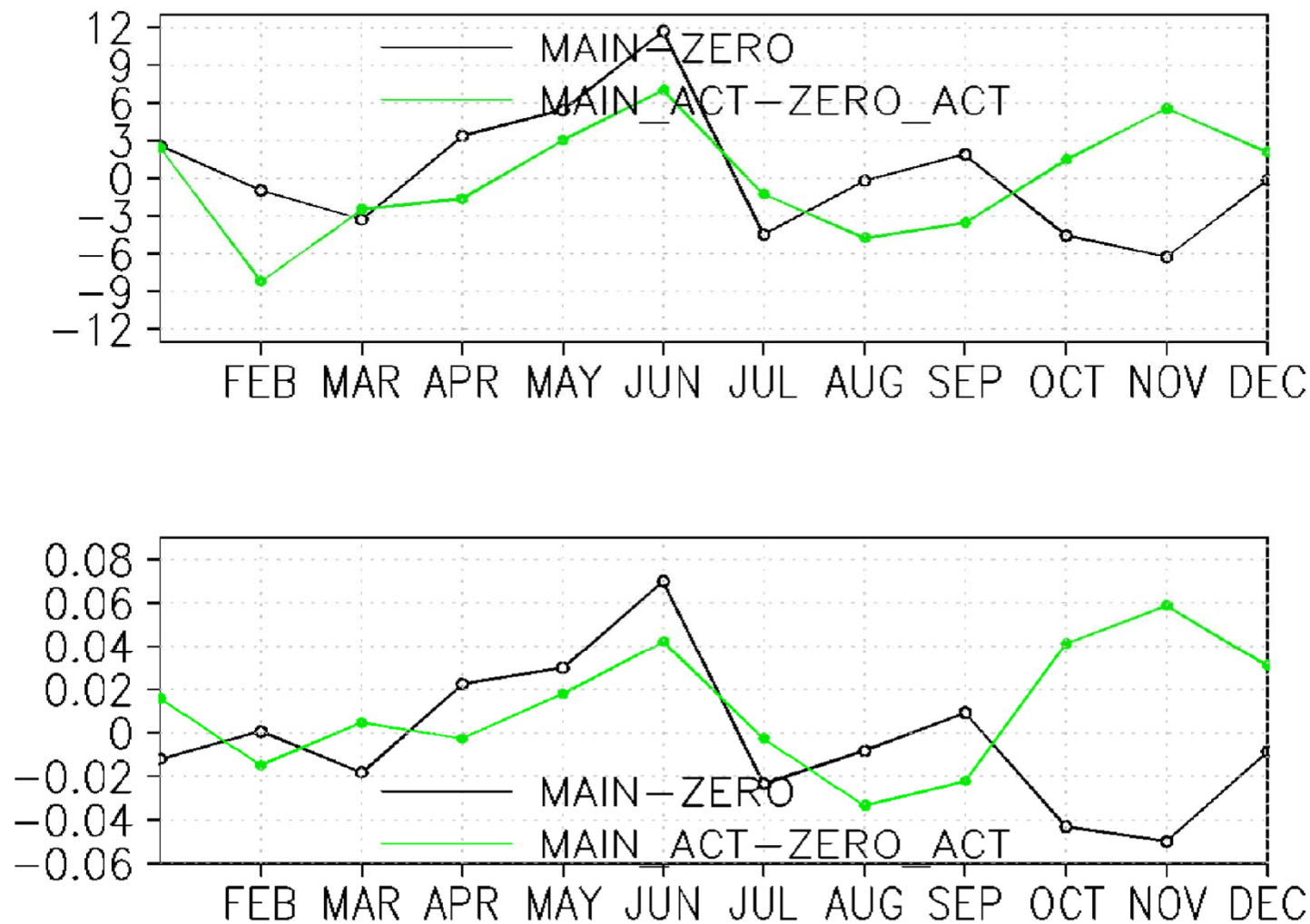
Supplementary Figure S1b. Comparison of mean
AOD in simulation with
REAS emissions
(Henriksson et al.,
2011) and new
simulations
with GAINS emissions,
multi-year monthly
means.



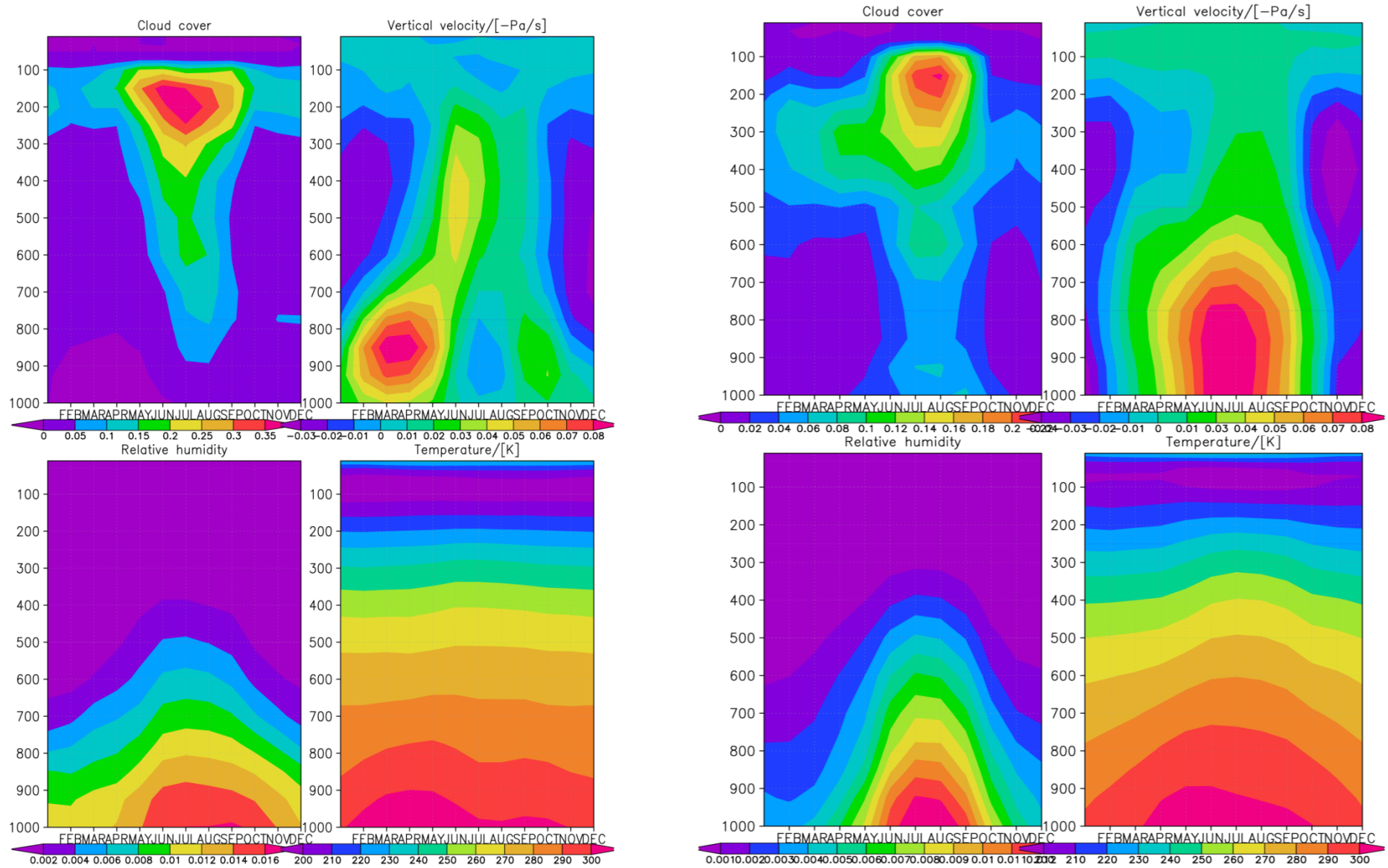
Supplementary Figure S2. Geopotential at 500 mbar for ERA Interim reanalysis (35-year average, above plots) in March-May (left) and June-August (right) and in MAIN simulation (7-year average, corresponding bottom plots).



Supplementary Figure S3. Atmospheric forcing in the different simulations in the area 65-90 E, 5-35 N calculated as difference between TOA and surface forcing, seven-year monthly means.

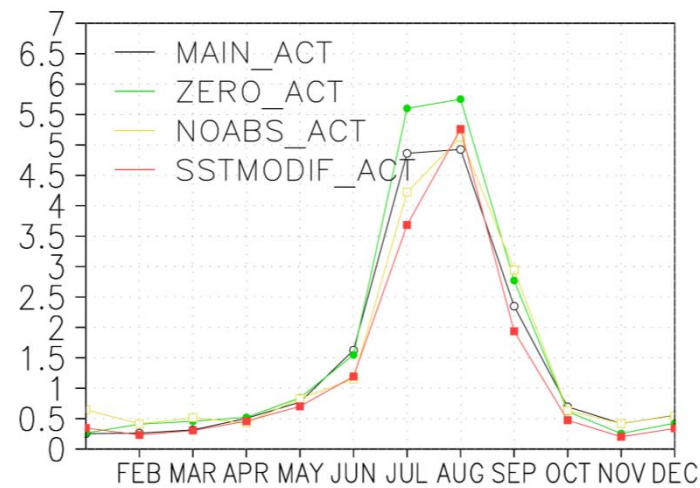
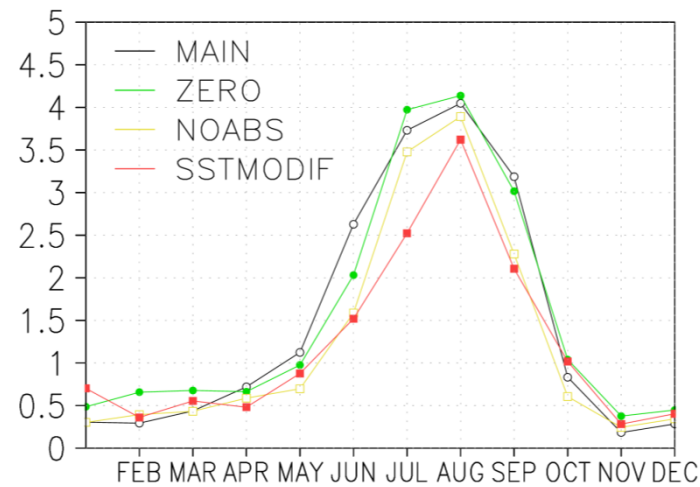


Supplementary Figure S4. Above: LW radiative flux anomalies at TOA, below: total cloud cover anomalies, seven-year monthly means in the area 65-90 E, 5-35 N.

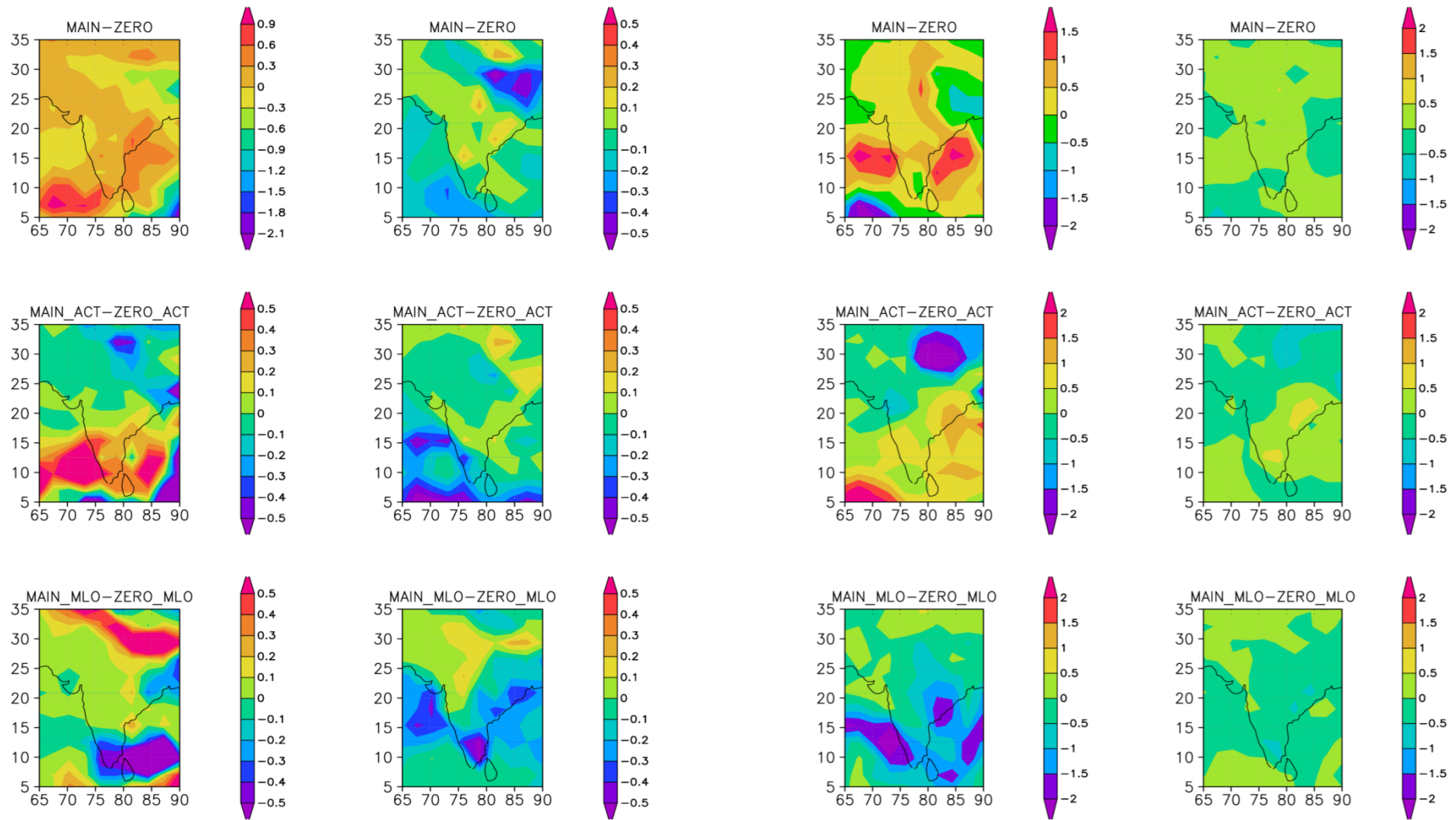


Supplementary Figure S5. Cloud cover, vertical velocity, specific humidity and temperature climatology from MAIN simulation.

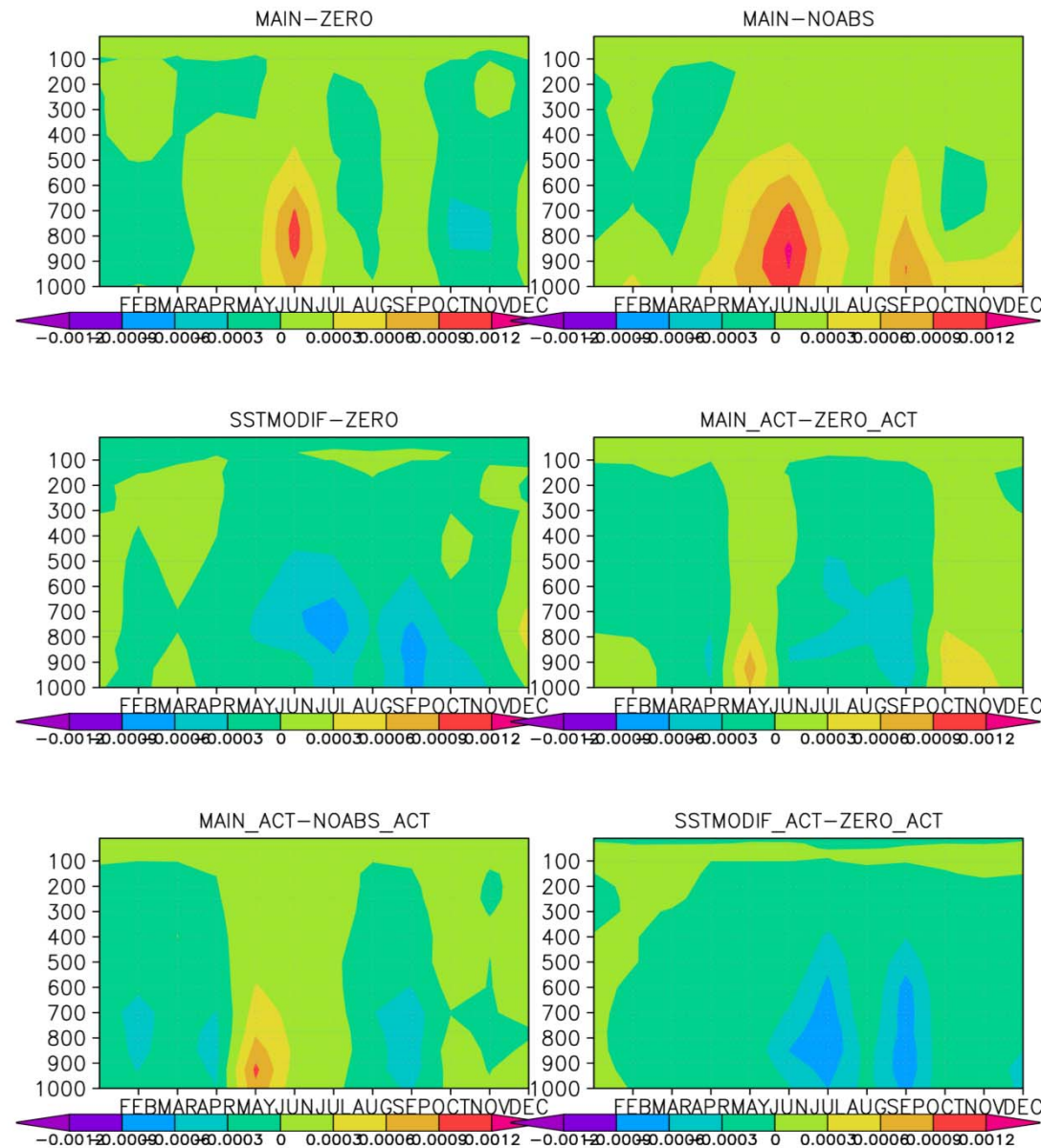
Left: area 65-90 E, 20-35 N, right: area 75-80 E, 10-20 N.



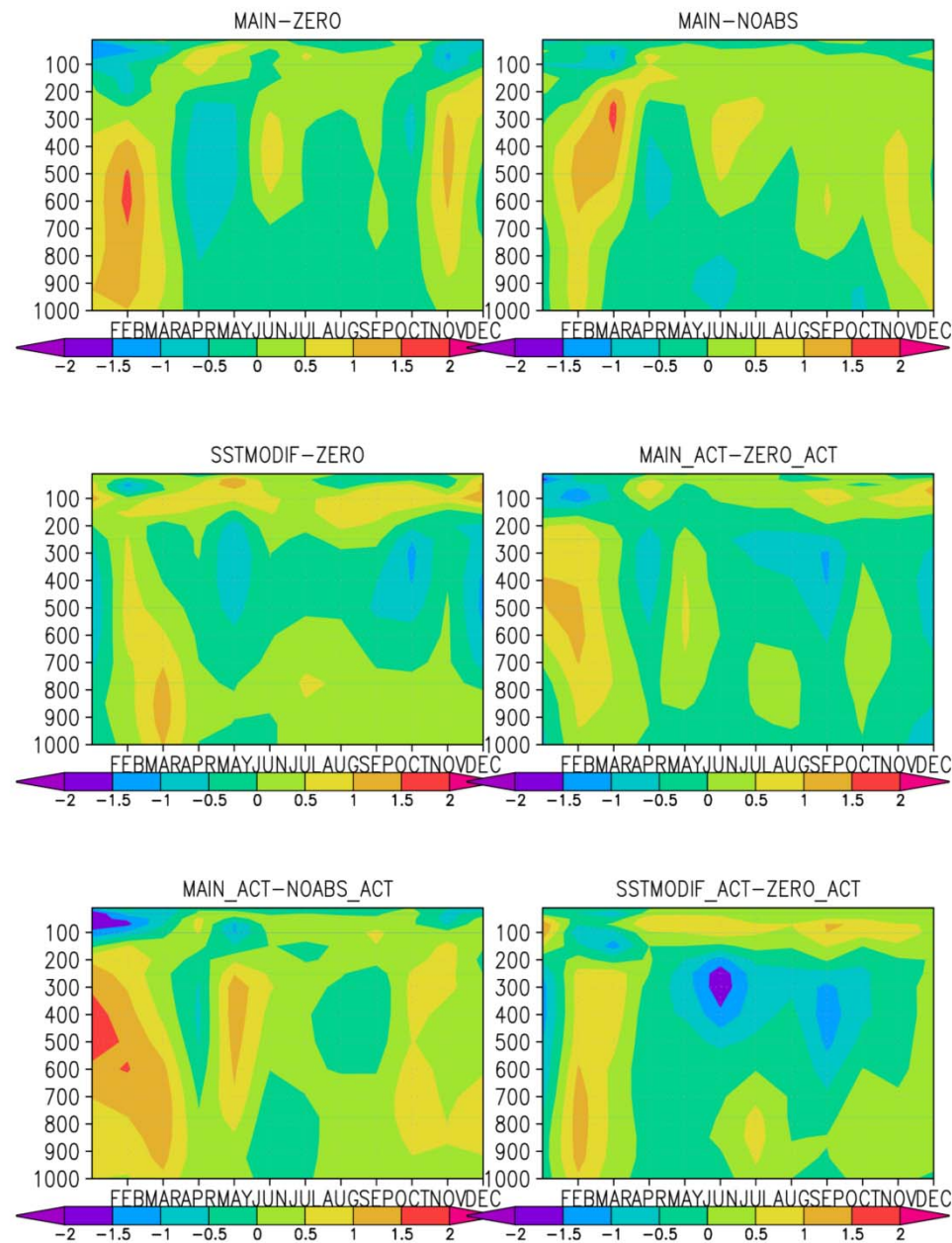
Supplementary Figure S6. Precipitation (mm/d) in the area 65-90 E, 20-35 N, multi-year monthly means.



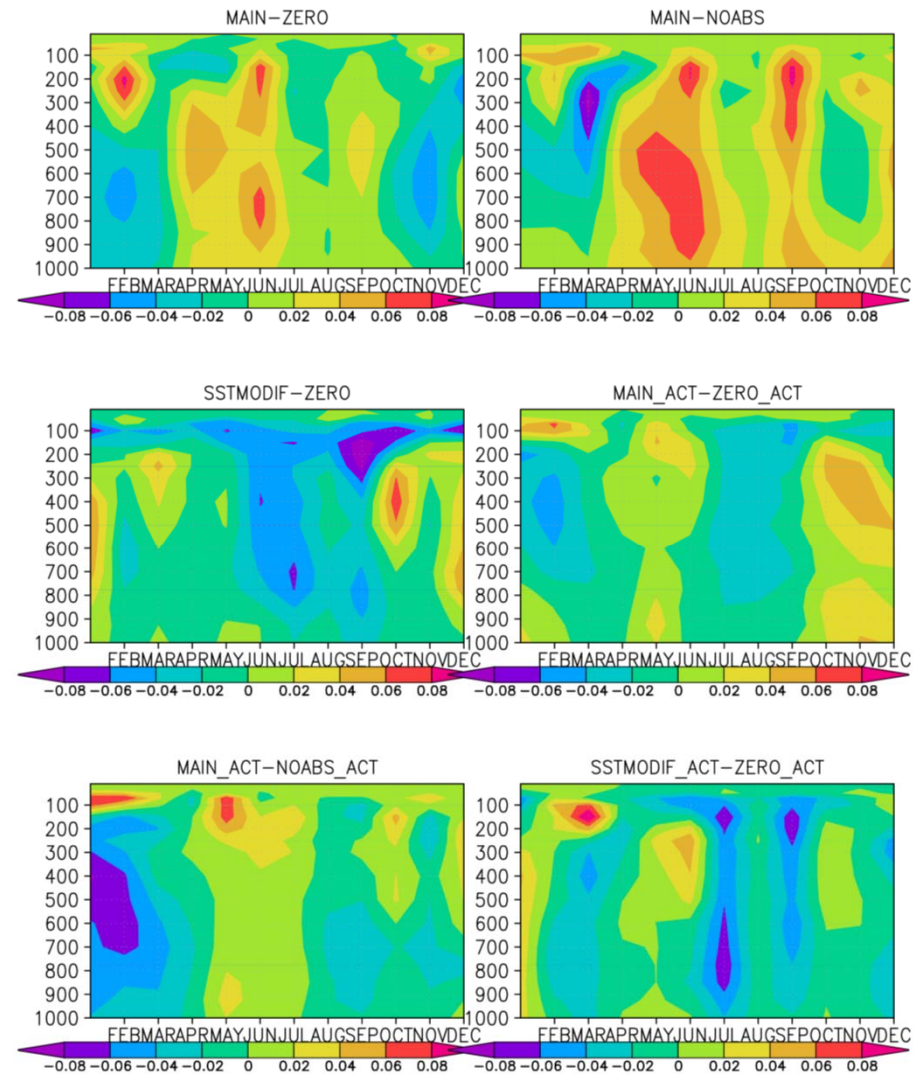
Supplementary Figure S7. Precipitation and evaporation anomalies (mm/d) for March-May (left array) and June-August (right array), multi-year monthly means.



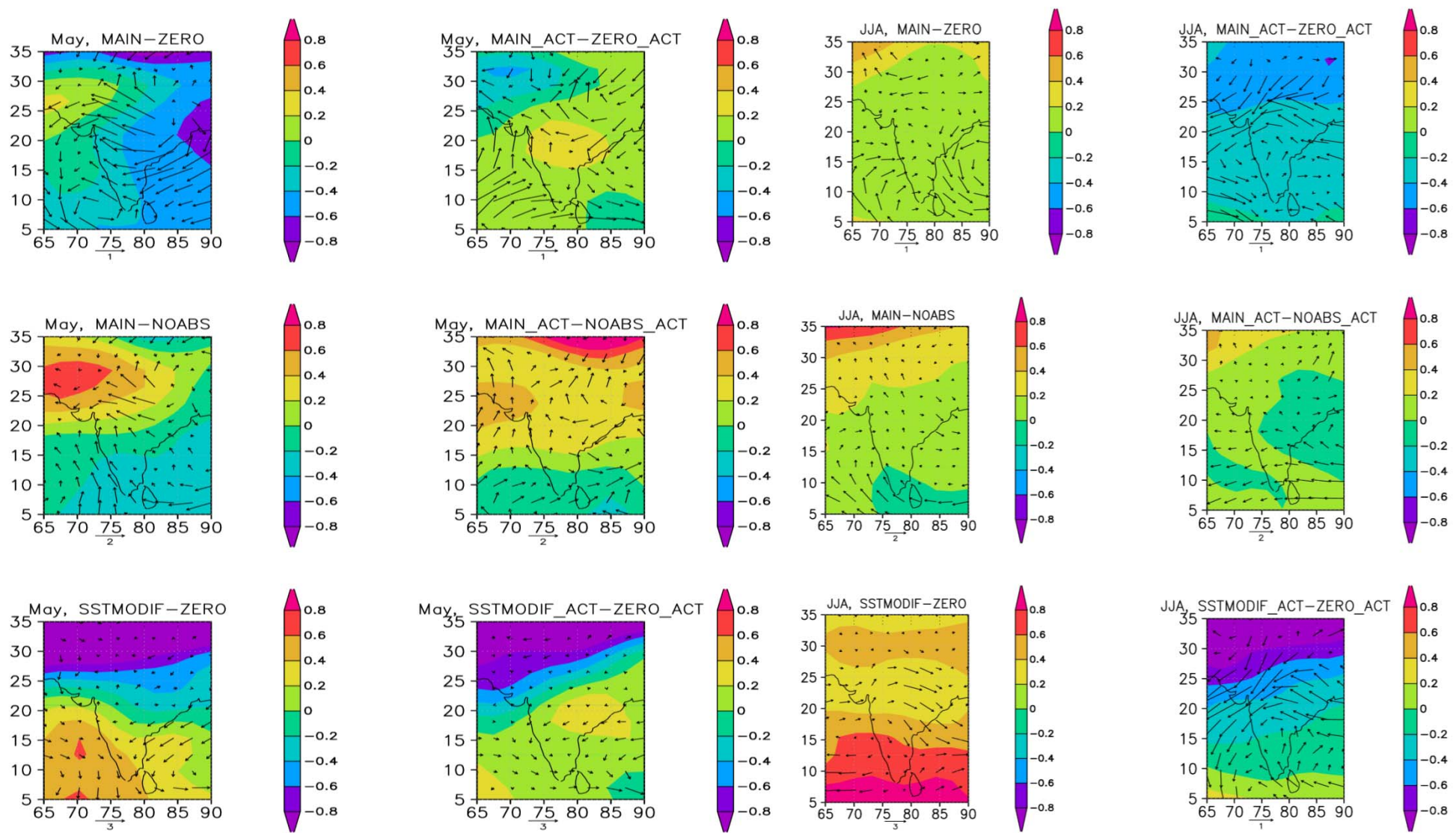
Supplementary Figure S8. Specific humidity (kg/kg) anomalies in the area (20-35 N, 65-90 E) in the different simulations.



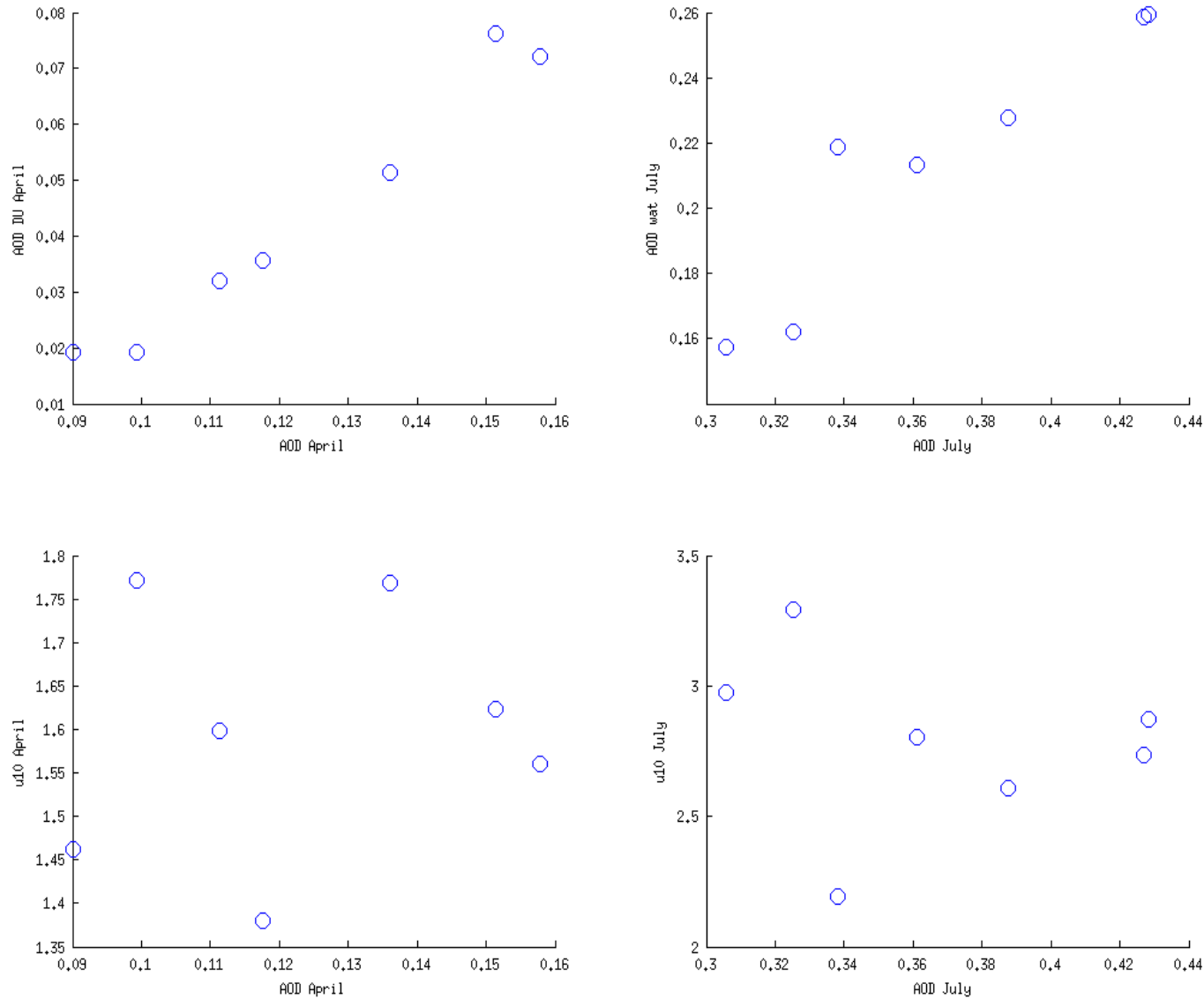
Supplementary Figure S9. Temperature anomalies (K) in the area (20-35 N, 65-90 E) in the different simulations.



Supplementary Figure S10. Relative humidity anomalies in the area (20-35 N, 65-90 E) in the different simulations.



Supplementary Figure S11. Wind anomalies at the surface and temperature anomalies at 200 hPa in the months of May (left) and June-August (right) in the different simulations.



Supplementary Figure S12. Interannual variability of top left) AOD and mineral dust AOD in April, top right) AOD and aerosol water AOD in July, bottom left) AOD and 10 m u-wind in April, bottom right) AOD and 10 m u-wind in April. Averages over area 20-35 N, 65-90 E.

	Global emis sions				India n emis sion s		
Gg a-1 in 2005	BC	OC	SO ₂		BC	OC	SO ₂
Energy production and distribution	519	448	58838		12	12	3729
Industrial combustion and processes	395	467	25880		104	156	1712
Residential and commercial combustion	2957	9793	6350		401	1522	366
Transport	1016	1001	2162		75	1922	76
Agricultural waste burning	308	1194	156		47	171	17
Waste treatment and disposal	96	748	63		12	90	4
Other	0	0	2142		0	0	0
Total	5292	13650	95592		650	3873	5905
International shipping	141	150	13050				

Supplementary Table 1. The anthropogenic emissions used.