

Modeling Lightning Activity in the Third Pole Region: Performance of a km-Scale ICON-CLM Simulation

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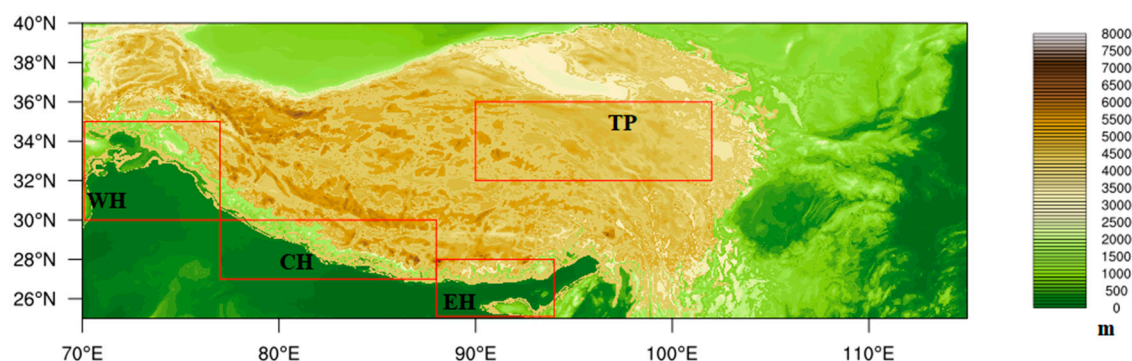


Figure S1. Orography of the study domains, red boxes are the area analysed in detail.

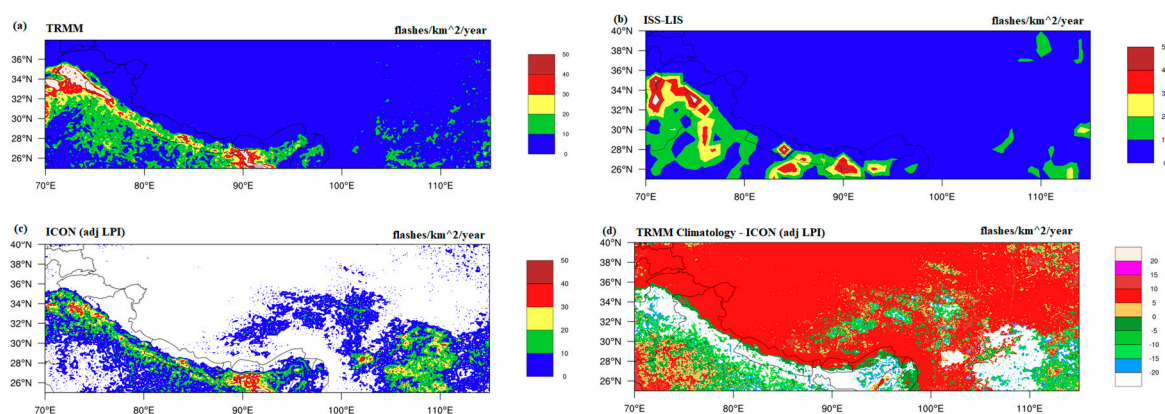


Figure S2. Annual average value of a) TRMM climatology, b) ISS-LIS observed data mapped on $1^\circ \times 1^\circ$ grid, c) adjusted LPI, d) difference between climatology and adjusted LPI.

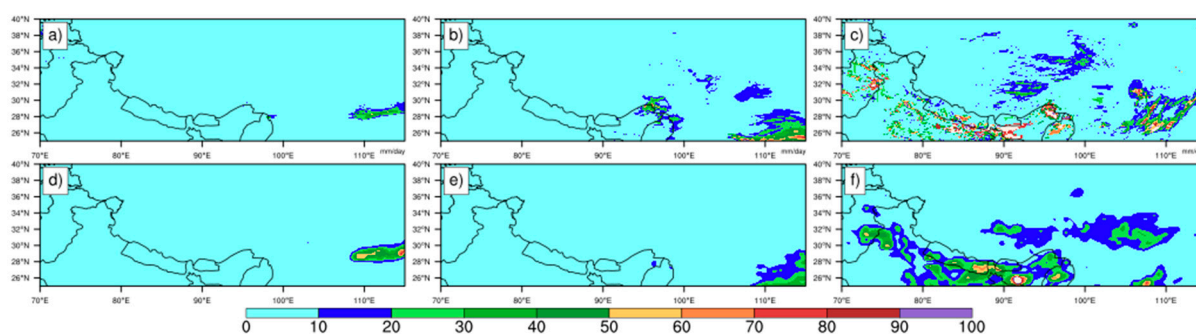


Figure S3. a), b), c) ICON simulated, and d), e), f) observed precipitation per day for the respective events discussed in Figure 7.

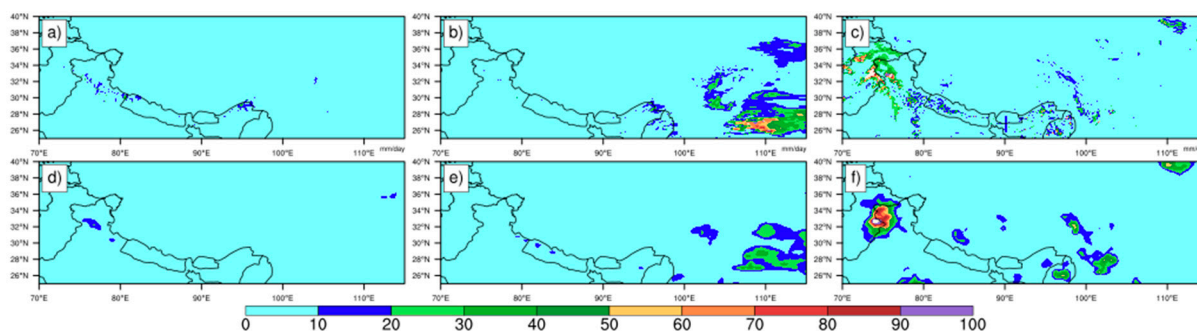


Figure S4. a), b), c) ICON simulated, and d), e), f) observed precipitation per day for the respective events discussed in Figure 8.

Table S1. Monthly regression coefficient for different domain with respect to observed lightning, climatology, and simulation.

	Monthly	Observation	Model
TP	Climatology	0.91	0.96
	Observation	1	0.94
WH	Climatology	0.84	0.91
	Observation	1	0.85
CH	Climatology	0.72	0.81
	Observation	1	0.62
EH	Climatology	0.91	0.85
	Observation	1	0.77
Domain	Climatology	0.93	0.90
	Observation	1	0.72

Table S2. Diurnal regression coefficient for different domain with respect to observed lightning, climatology, and simulation.

	Diurnal	Observation	Model
TP	Climatology	0.13	0.14
	Observation	1	0.84
WH	Climatology	0.58	0.80
	Observation	1	0.74
CH	Climatology	0.65	0.62
	Observation	1	0.82
EH	Climatology	0.56	0.89
	Observation	1	0.70
Domain	Climatology	0.26	0.89
	Observation	1	0.25