

Table 1. Summary of radiative flux statistics for 14 September case study. Mean down-welling SW radiation at surface ($SW\downarrow_{sfc}$), radiative balance (RB) and absorbed SW radiation (ASW), averaged over 5-km domain, the 1-km region of the 5-km domain, and the 1-km domain, all in units $W\ m^{-2}$. Uncertainties show standard deviation across domain. Averaged over 24 hours, from dawn to dawn, between 10:00~UTC 14 and 10:00~UTC 15 September.

	$SW\downarrow_{sfc}$			RB			ASW		
Scenario	5-km	5-km over 1-km	1-km	5-km	5-km over 1-km	1-km	5-km	5-km over 1-km	1-km
FE	220±33	226± 8	226±10	64±46	53± 9	53± 9	134±11	137± 6	137± 7
nFE	254±37	269±11	270±11	65±49	55±15	56±15	106± 6	104± 2	104± 2
nARI	272±45	285±21	289±19	66±54	55±22	58±21	92± 5	91± 2	91± 2
Ctrl	272±45	285±21	289±19	66±54	55±21	58±21	92± 5	91± 2	91± 2

Table 2. Summary of radiative flux statistics for 18 September case study. Mean down-welling SW radiation at surface ($SW\downarrow_{sfc}$), radiative balance (RB) and absorbed SW radiation (ASW), averaged over 5-km domain, the 1-km region of the 5-km domain, and the 1-km domain, all in units $W\ m^{-2}$.

Uncertainties show standard deviation across domain. Averaged over 24 hours, from dawn to dawn, between 10:00 UTC 18 and 10:00 UTC 19 September.

	SW \downarrow_{sfc}			RB			ASW		
Scenario	5-km	5-km over 1-km	1-km	5-km	5-km over 1-km	1-km	5-km	5-km over 1-km	1-km
FE	224±42	215±33	227±34	92±60	72±35	78±36	123±10	129± 8	130± 9
nFE	243±48	239±44	255±46	94±66	82±48	88±50	104± 6	103± 4	103± 5
nARI	253±53	243±47	264±50	93±69	75±49	87±52	95± 6	95± 4	94± 4
Ctrl	253±53	245±47	263±49	94±69	82±50	90±53	95± 6	95± 4	94± 4
FE_nCU	233±39	230±22	234±23	71±50	56±22	59±23	125±10	131± 8	130± 8
nFE_nCU	255±46	262±29	267±32	71±57	56±29	62±31	106± 6	104± 3	103± 4
nARI_nCU	267±52	273±35	281±35	71±61	57±34	64±35	97± 6	96± 3	95± 3
Ctrl_nCU	267±52	273±34	280±36	72±61	57±33	64±36	97± 6	96± 3	95± 3

Table 3. Summary of radiative flux statistics for 23 September case study. Mean down-welling SW radiation at surface ($SW\downarrow_{sfc}$), radiative balance (RB) and absorbed SW radiation (ASW), averaged over 5-km domain, the 1-km region of the 5-km domain, and the 1-km domain, all in units $W\ m^{-2}$. Uncertainties show standard deviation across domain. Averaged over 24 hours, from dawn to dawn, between 10:00 UTC 23 and 10:00 UTC 24 September.

	$SW\downarrow_{sfc}$			RB			ASW		
Scenario	5-km	5-km over 1-km	1-km	5-km	5-km over 1-km	1-km	5-km	5-km over 1-km	1-km
FE	214±58	242±26	242±30	112±69	96±28	95±31	122±12	117± 6	117± 7
nFE	235±65	263±31	263±35	114±74	102±34	101±37	103± 9	101± 4	101± 5
nARI	243±71	275±34	275±38	112±77	103±34	103±37	96± 8	94± 4	94± 4
Ctrl	244±70	273±35	274±38	114±77	104±37	104±40	96± 8	94± 4	94± 5

Table 4. Summary of meteorological and dynamical variable statistics for 14 September case study. Mean temperature at two meters above surface (T_2), planetary boundary layer height, as calculated by the YSU PBL parameterisation (PBLH), and accumulated precipitation. Averaged over 5-km domain, the 1-km region of the 5-km domain, and the 1-km domain. Uncertainties show standard deviation across domain. Averaged or accumulated over 24 hours, from dawn to dawn, between 10:00 UTC 14 and 10:00 UTC 15 September.

	T_2 (°C)			PBLH (m)			Precipitation (mm)		
Scenario	5-km	5-km over 1-km	1-km	5-km	5-km over 1-km	1-km	5-km	5-km over 1-km	1-km
FE	30.4±0.9	30.9±0.4	30.8±0.6	681±235	661±92	594±159	0.49±0.59	0.01±0.05	0.00±0.00
nFE	30.7±1.0	31.4±0.4	31.3±0.6	779±243	819±108	725±191	0.54±0.60	0.04±0.11	0.00±0.00
nARI	30.9±1.0	31.5±0.4	31.4±0.6	838±261	886±109	797±205	0.58±0.61	0.08±0.16	0.00±0.04
Ctrl	30.9±1.0	31.5±0.4	31.4±0.6	837±259	892±109	798±207	0.57±0.61	0.08±0.14	0.01±0.05

Table 5. Summary of meteorological and dynamical variable statistics for 18 September case study. Mean temperature at two meters above surface (T_2), planetary boundary layer height, as calculated by the YSU PBL parameterisation (PBLH), and accumulated precipitation. Averaged over 5-km domain, the 1-km region of the 5-km domain, and the 1-km domain. Uncertainties show standard deviation across domain. Averaged or accumulated over 24 hours, from dawn to dawn, between 10:00 UTC 18 and 10:00 UTC 19 September.

Scenario	T_2 (°C)			PBLH (m)			Precipitation (mm)		
	5-km	5-km over 1-km	1-km	5-km	5-km over 1-km	1-km	5-km	5-km over 1-km	1-km
FE	29.2±0.9	29.3±0.6	29.4±0.7	741±245	733±187	720±215	2.50±2.49	1.89±1.62	2.30±4.13
nFE	29.3±1.0	29.4±0.5	29.4±0.7	761±255	732±170	695±225	3.09±3.09	2.72±1.38	3.14±4.19
nARI	29.4±1.0	29.5±0.6	29.5±0.8	778±254	754±176	713±238	3.11±3.11	2.70±1.62	3.95±5.12
Ctrl	29.3±1.0	29.4±0.6	29.4±0.8	772±256	741±166	702±234	3.23±3.18	3.03±1.46	3.72±4.54
FE_nCU	29.3±1.0	29.7±0.4	29.6±0.6	774±260	781±155	723±191	1.58±4.14	0.51±1.04	1.16±2.25
nFE_nCU	29.5±1.0	29.9±0.4	29.8±0.6	801±275	793±160	727±204	1.58±4.11	0.66±1.40	1.46±2.13
nARI_nCU	29.6±1.0	30.1±0.4	30.0±0.6	815±281	827±169	752±209	1.72±3.95	0.61±1.27	1.67±2.20
Ctrl_nCU	29.6±1.1	30.1±0.4	29.9±0.6	814±282	834±165	742±206	1.73±4.40	0.58±1.18	1.77±2.56

Table 6. Summary of meteorological and dynamical variable statistics for 23 September case study. Mean temperature at two meters above surface (T_2), planetary boundary layer height, as calculated by the YSU PBL parameterisation (PBLH), and accumulated precipitation. Averaged over 5-km domain, the 1-km region of the 5-km domain, and the 1-km domain. Uncertainties show standard deviation across domain. Averaged or accumulated over 24 hours, from dawn to dawn, between 10:00 UTC 23 and 10:00 UTC 24 September.

	T_2 (°C)			PBLH (m)			Precipitation (mm)		
Scenario	5-km	5-km over 1-km	1-km	5-km	5-km over 1-km	1-km	5-km	5-km over 1-km	1-km
FE	27.2±1.0	27.6±0.3	27.5±0.4	487±174	554±75	503±115	5.22±7.56	0.00±0.03	0.00±0.02
nFE	27.4±1.1	27.9±0.3	27.8±0.4	522±192	587±80	537±124	5.74±7.93	0.01±0.03	0.00±0.01
nARI	27.4±1.1	28.0±0.3	28.0±0.4	530±197	605±77	557±127	5.11±6.80	0.00±0.03	0.00±0.02
Ctrl	27.4±1.1	28.0±0.3	27.9±0.4	533±198	600±79	553±127	5.57±7.20	0.00±0.01	0.00±0.01