Time History of Fire Evolution form MODIS Observation

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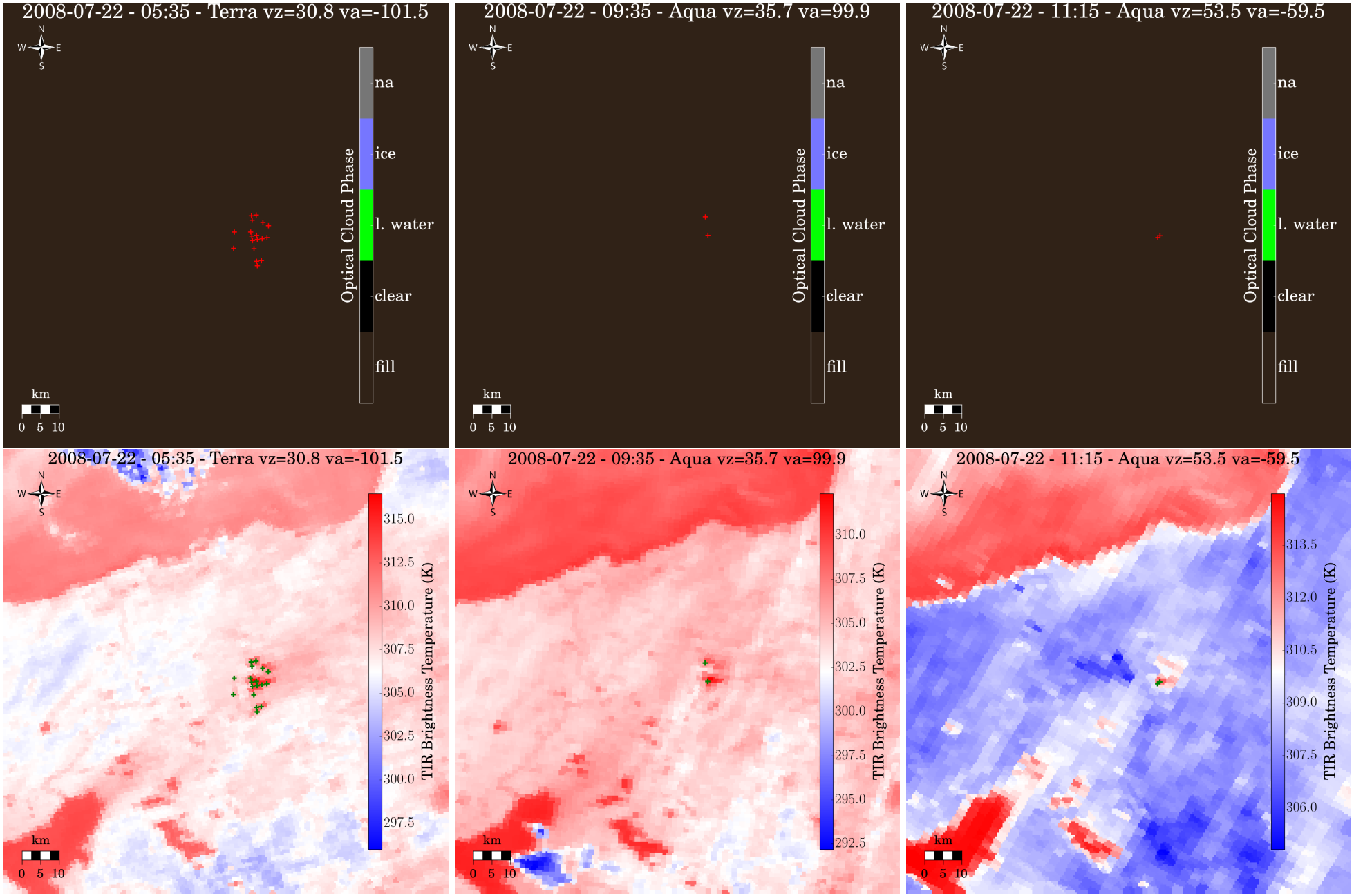
In the following pages, (i) figures from the upper row are color composite images made from the MODIS bands 0.6 (red,R), 0.55 (green,G) and 0.47 μm (blue,B) and geo-referenced on a 120x120 km^2 grid with a 0.5 km resolution around the location of the MISR detected fire, (ii) and figures in the lower row are brigthness temperature in the middle infra red (MODIS band 3.9 μ) where the green crosses mark the fire pixels of the MOD14 product.

In the color composite images, height of the boundary layer from ECMWF forecast product is reported (hBL), as well as the plume height as derived from the original Plume Rise Model (PRMv0) of Freitas et al. (2007), updated versions of PRMv0, PRMv1 from Val Martin et al. (2012) and PRMv2 from Paugam et al. (2015), and the parameterization of (Sofiev et al., 2012, Sof).

In the MIR images, FRP from the biggest fire cluster formed of MOD14 pixels and located within 20 km of the fire location is reported. The Active Fire (AF) area ($AFarea$) of the fire cluster as derived from the Dozier (1981) algorithm is also reported. When hot pixels are present in the cluster ($T_{pixel} > 600\ K$), a filter is applied to remove cool (*i.e.* smoldering) pixels and FRP and AFarea of the new filtered cluster are indicated. For each pixel, the temperatue T_{pixel} is derived from the Dozier (1981) algorithm applied at the pixel level.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N
W
E
S
Optical Cloud Phase
na
ice
l. water
clear
fill
km
0 5 10
TIR Brightness Temperature (K)
315.0
312.5
310.0
307.5
305.0
302.5
300.0
297.5
310.0
307.5
305.0
302.5
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312.0
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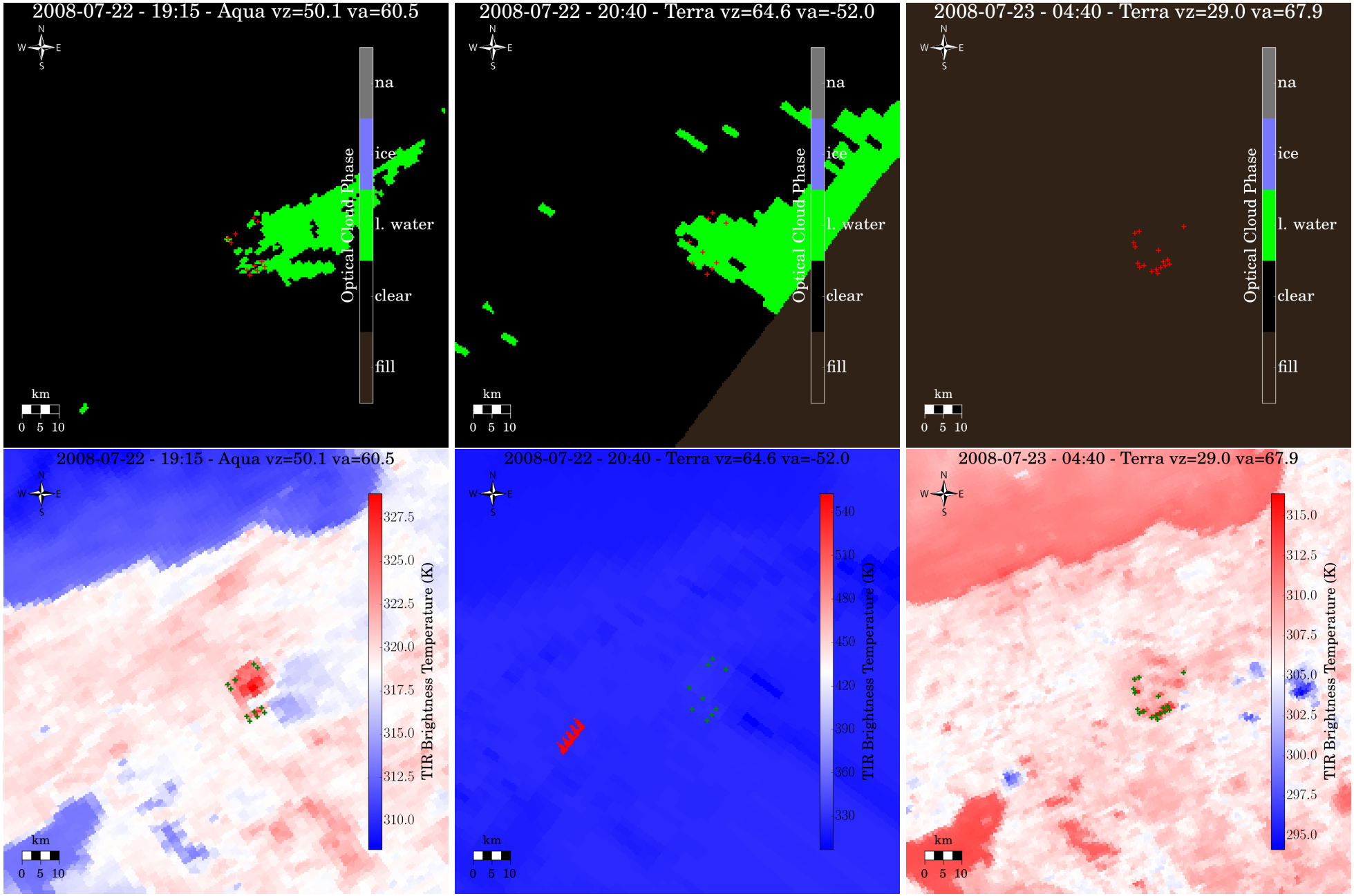
307.5
306.0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N
W
E
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Optical Cloud Phase
na
ice
l. water
clear
fill
km
0 5 10
TIR Brightness Temperature (K)
327.5
325.0
322.5
320.0
317.5
315.0
312.5
310.0
540
510
480
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420
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360
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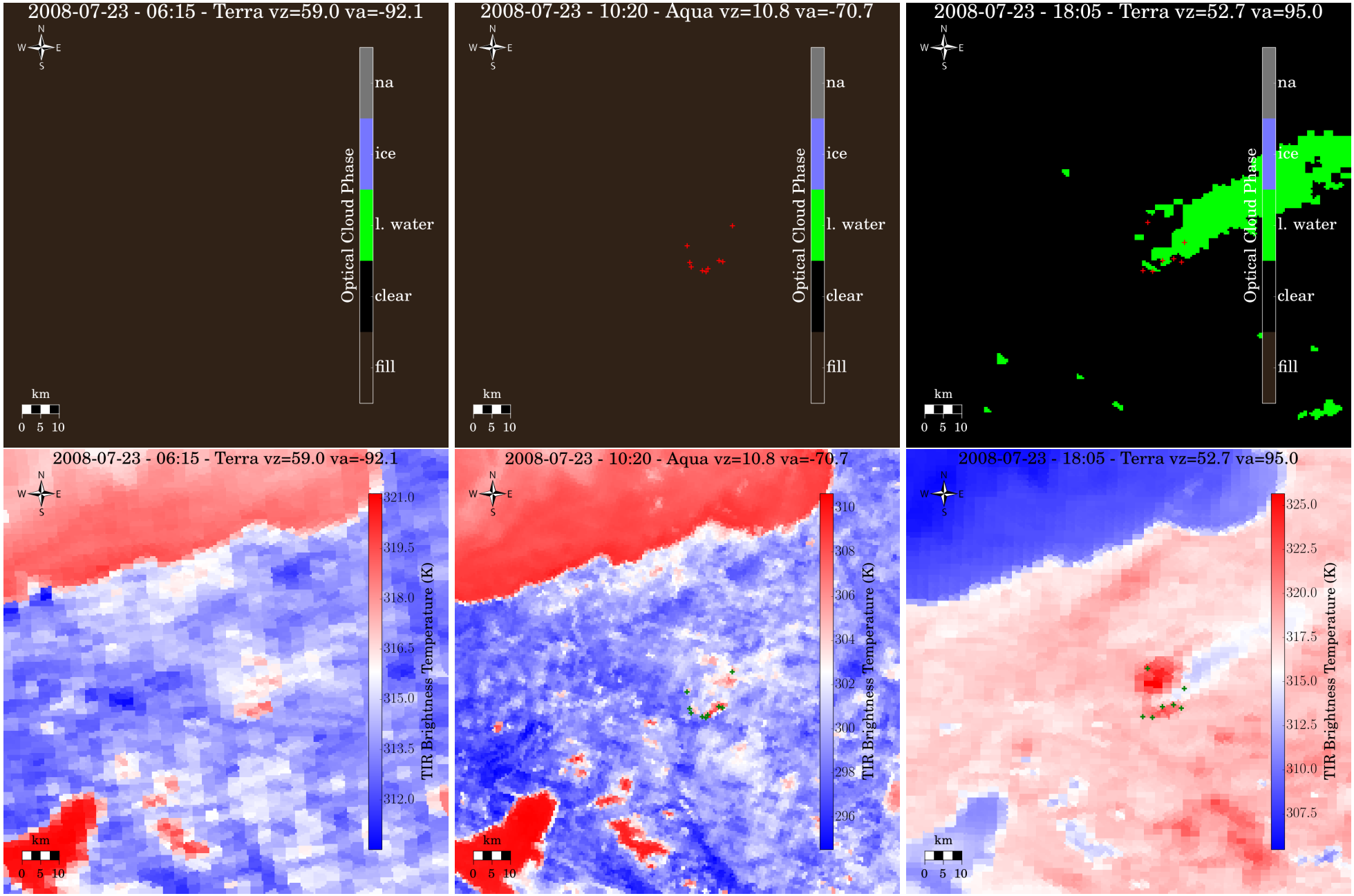
295.0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N
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Optical Cloud Phase
na
ice
l. water
clear
fill
km
0 5 10
2008-07-23 - 06:15 - Terra vz=59.0 va=-92.1
2008-07-23 - 10:20 - Aqua vz=10.8 va=-70.7
2008-07-23 - 18:05 - Terra vz=52.7 va=95.0
TIR Brightness Temperature (K)
321.0
319.5
318.0
316.5
315.0
313.5
312.0
310
308
306
304
302
300
298
296
325.0
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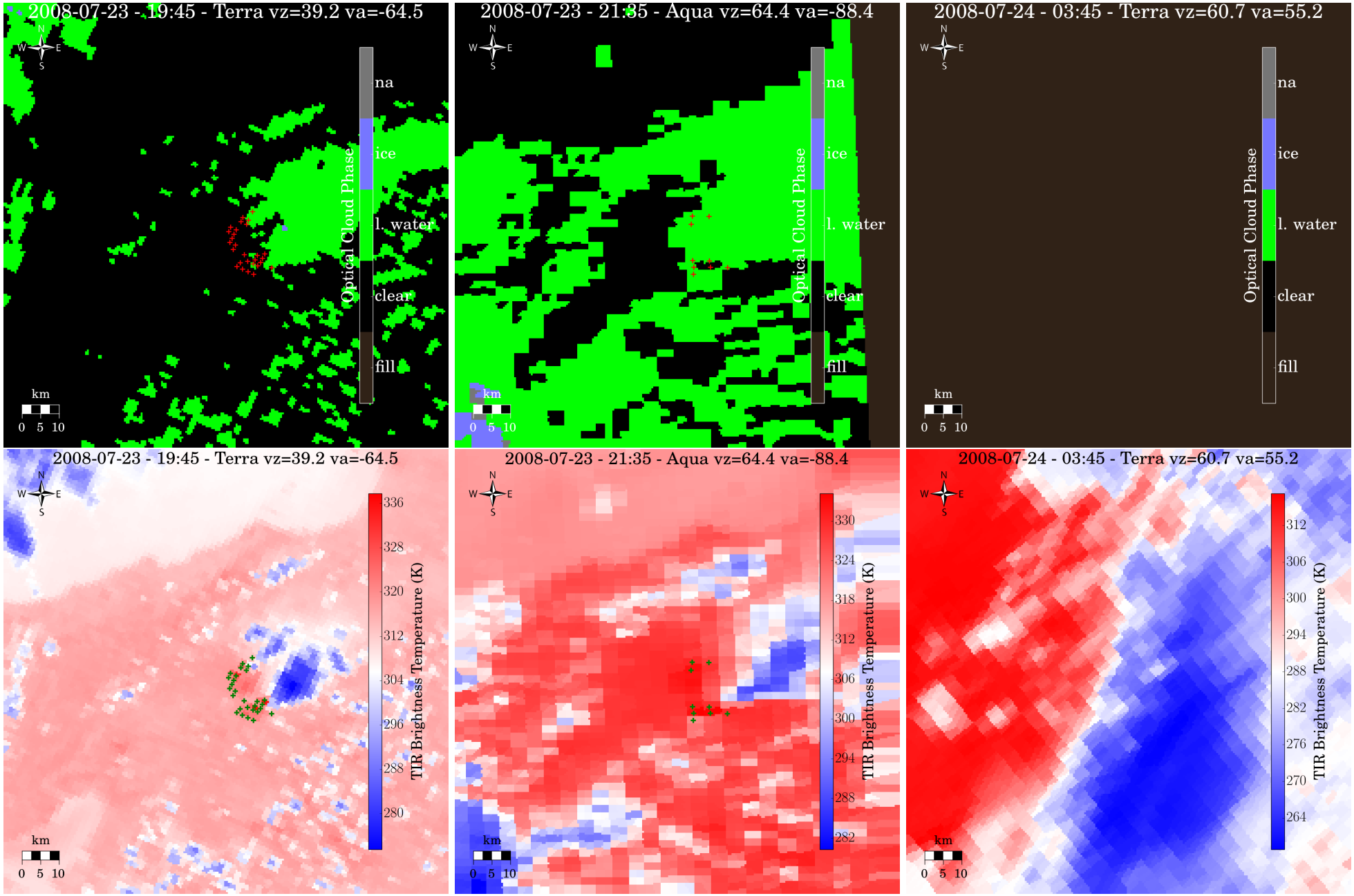
320.0
317.5
315.0
312.5
310.0
307.5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Optical Cloud Phase
na
ice
l. water
clear
fill
TIR Brightness Temperature (K)
km
0 5 10
N
W
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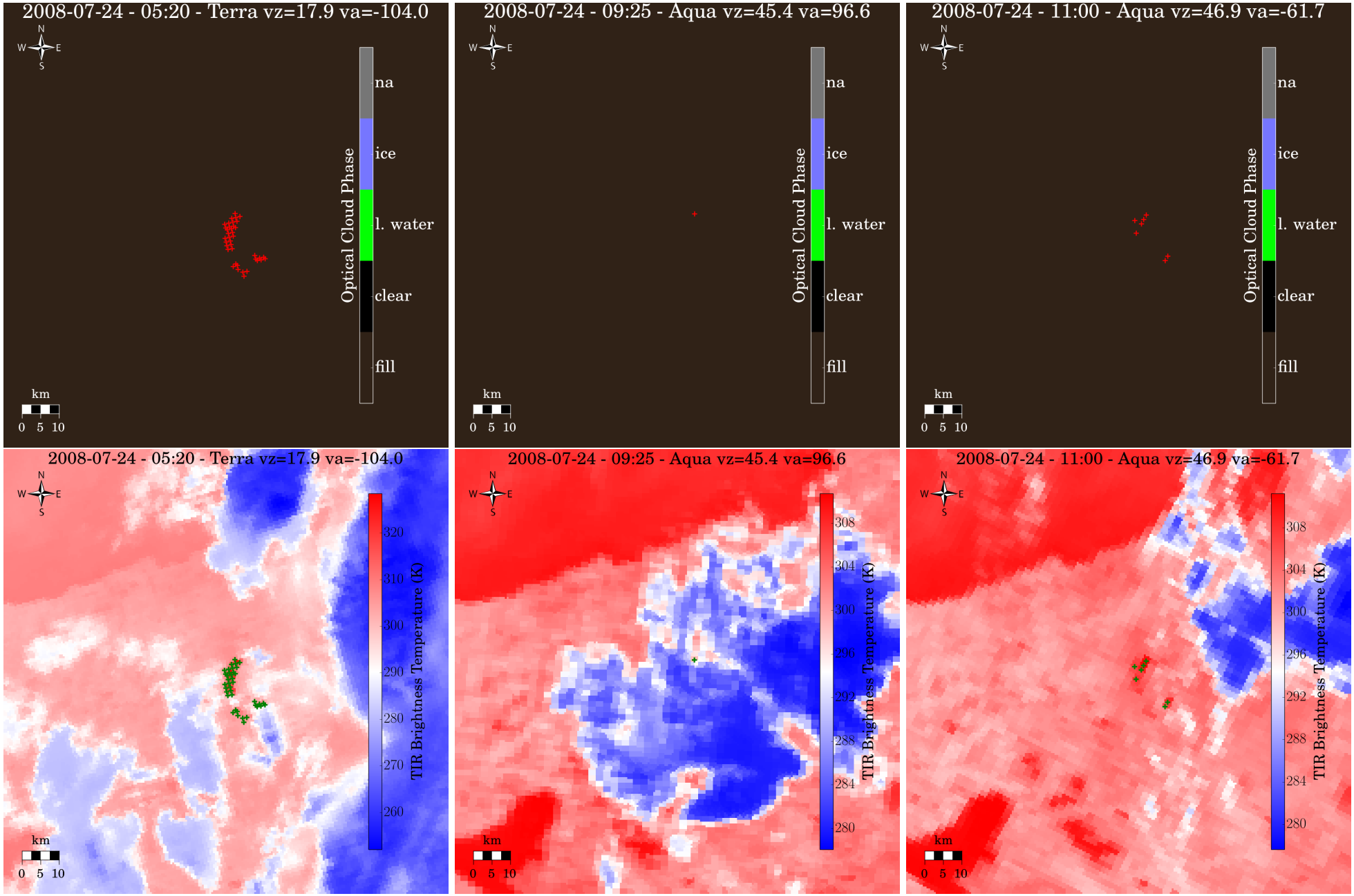
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N
W
E
S
Optical Cloud Phase
na
ice
l. water
clear
fill
km
0 5 10
2008-07-24 - 05:20 - Terra vz=17.9 va=-104.0
2008-07-24 - 09:25 - Aqua vz=45.4 va=96.6
2008-07-24 - 11:00 - Aqua vz=46.9 va=-61.7
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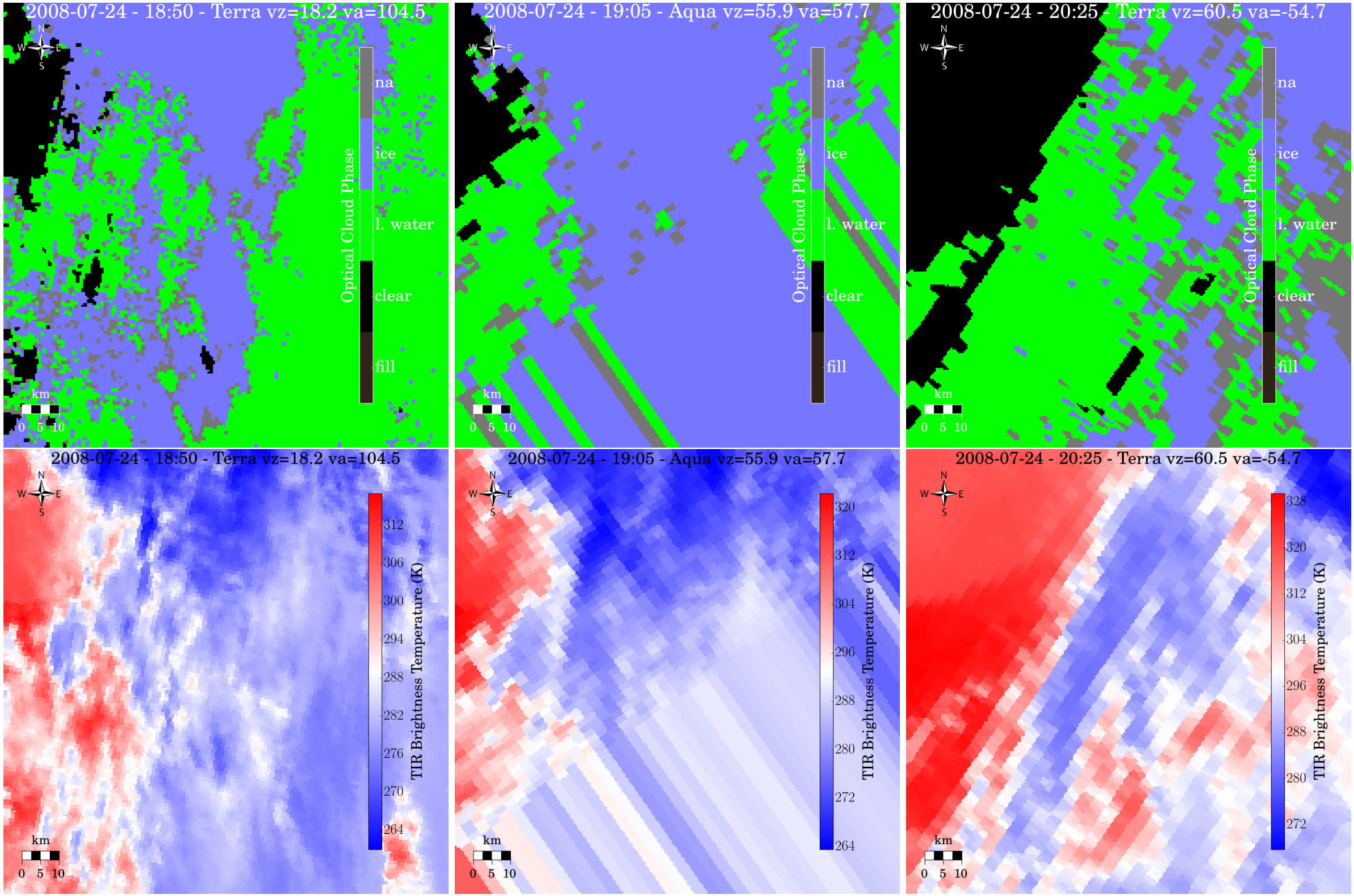
320
310
300
290
280
270
260
308
304
300
296
292
288
284
280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Optical Cloud Phase
na
ice
l. water
clear
fill
TIR Brightness Temperature (K)
km
0 5 10
N
W
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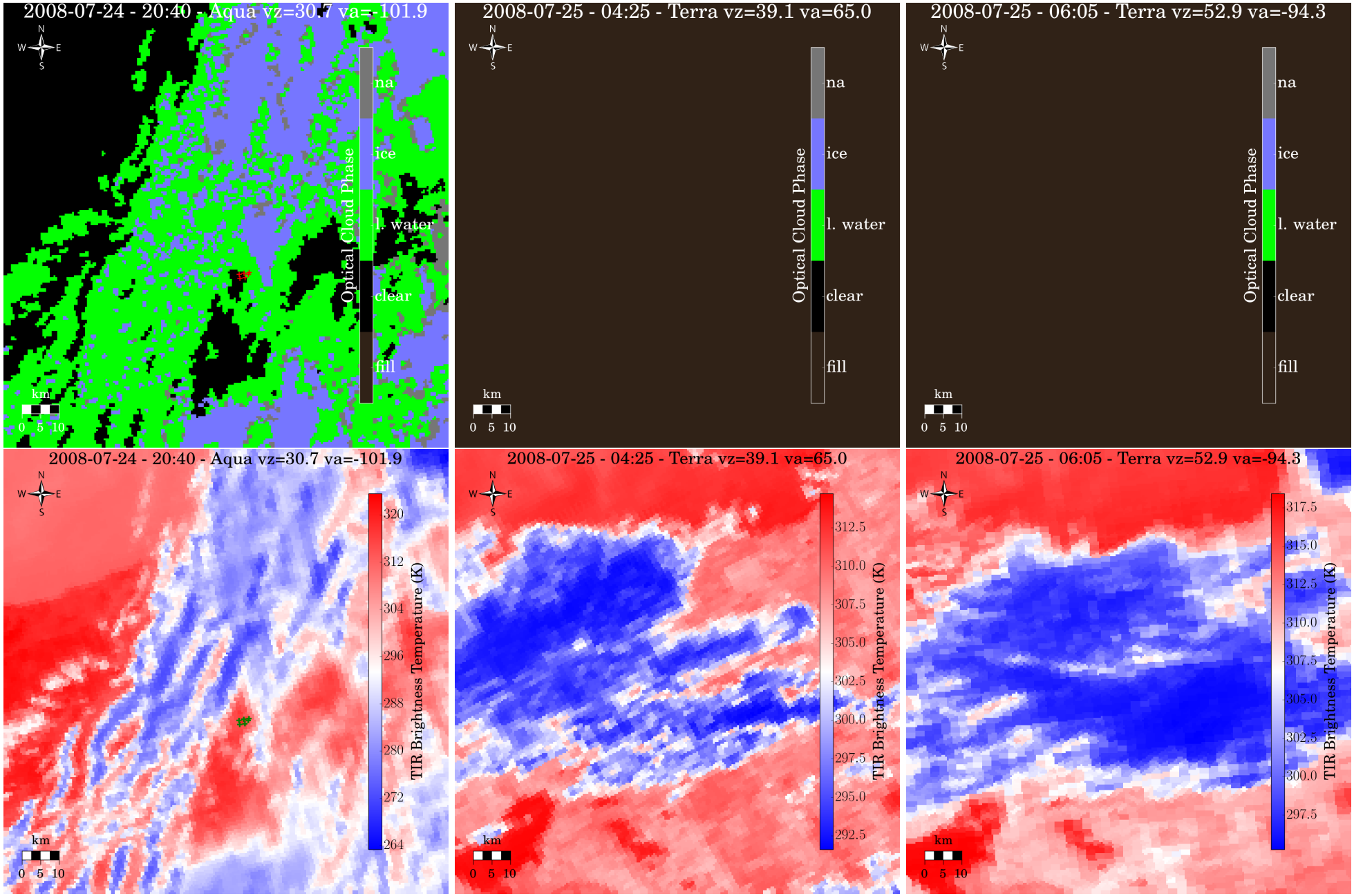
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N
W
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Optical Cloud Phase
na
ice
l. water
clear
fill
km
0 5 10
TIR Brightness Temperature (K)
320
312
304
296
288
280
272
264
312.5
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307.5
305.0
302.5
300.0
297.5
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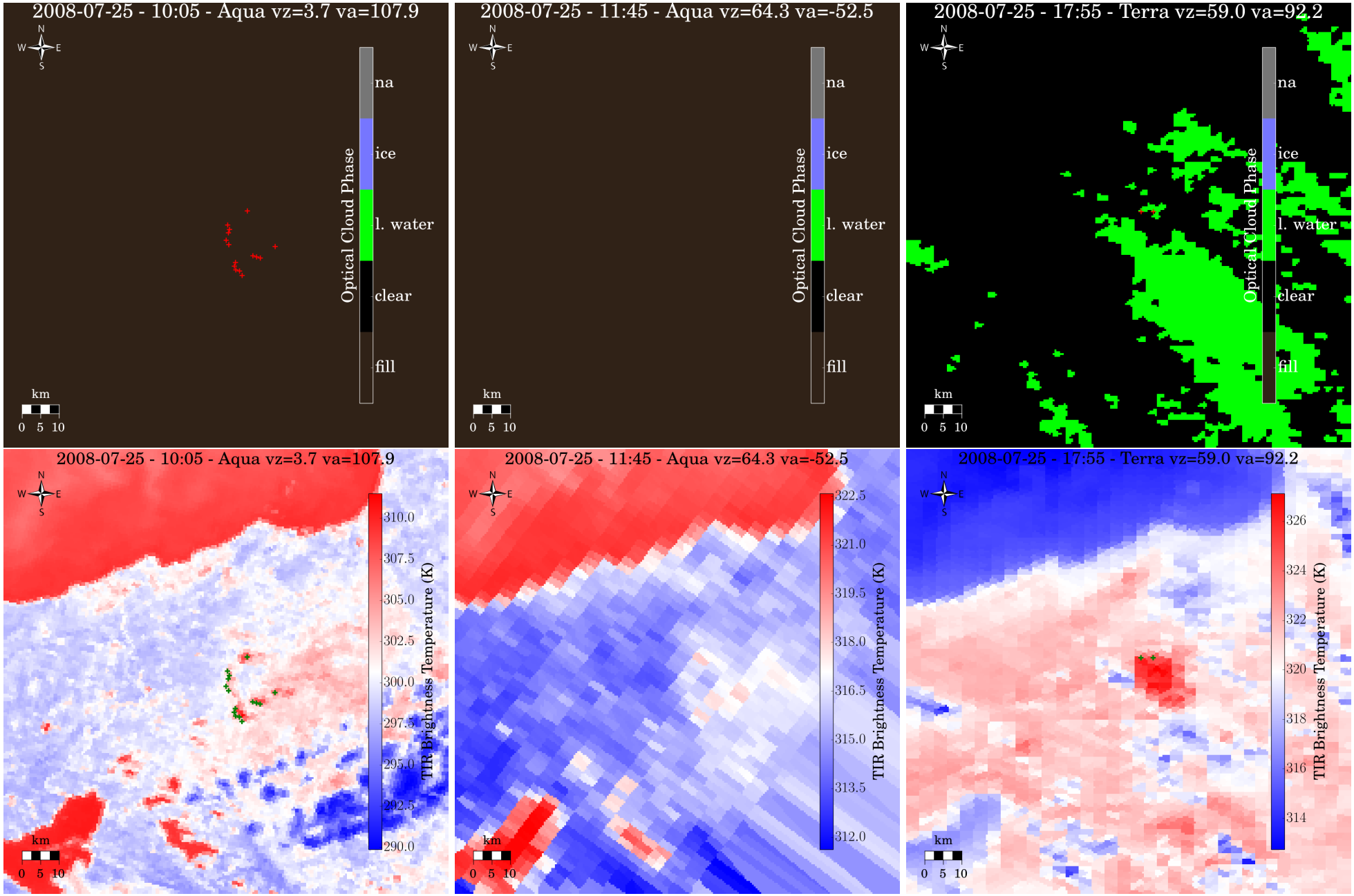
317.5
315.0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Optical Cloud Phase
na
ice
l. water
clear
fill
km
0 5 10
TIR Brightness Temperature (K)
310.0
307.5
305.0
302.5
300.0
297.5
295.0
292.5
290.0
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312.0
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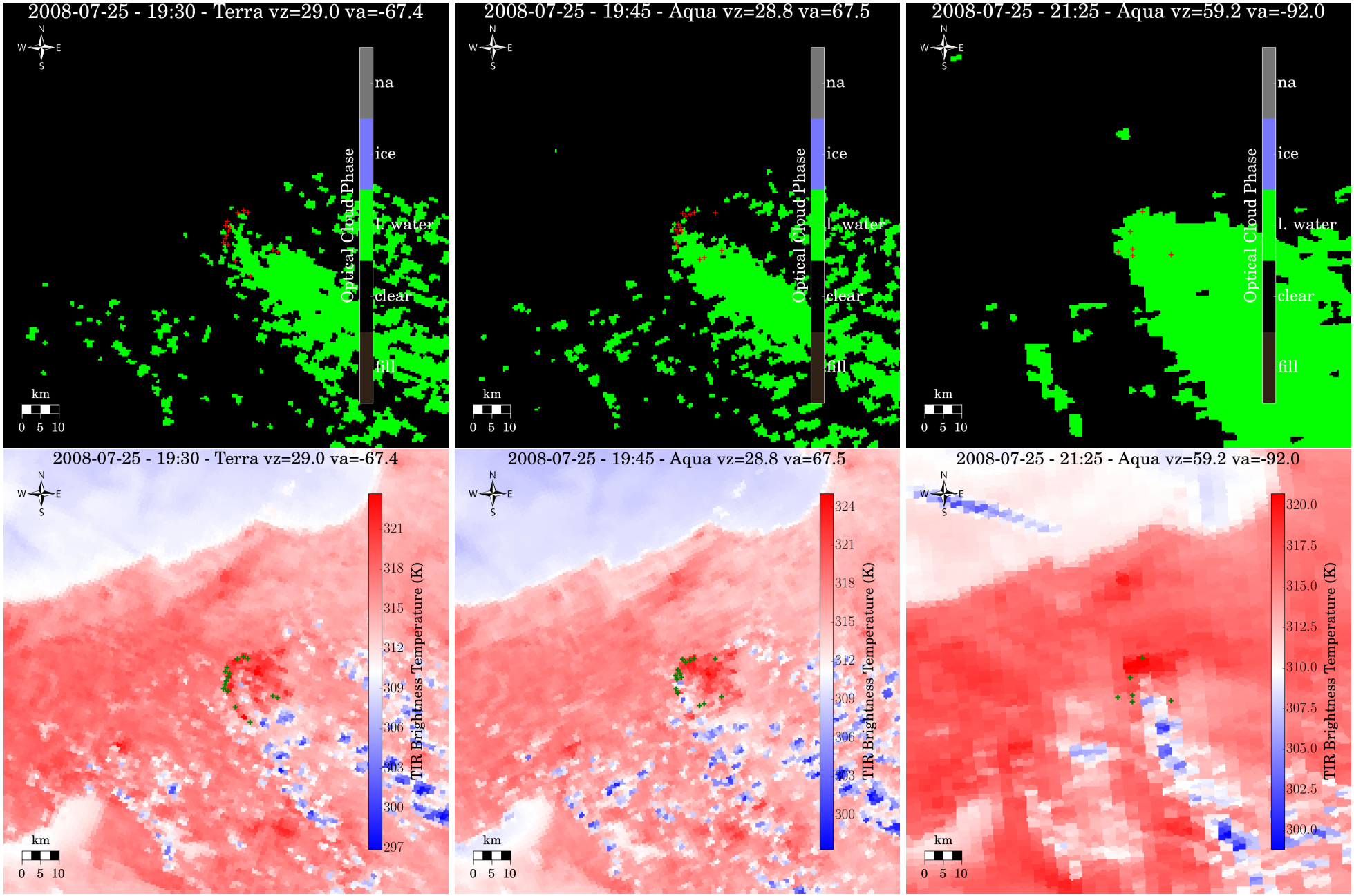
324
322
320
318
316
314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N
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Optical Cloud Phase
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ice
l. water
clear
fill
km
0 5 10
2008-07-25 - 19:30 - Terra vz=29.0 va=-67.4
2008-07-25 - 19:45 - Aqua vz=28.8 va=67.5
2008-07-25 - 21:25 - Aqua vz=59.2 va=-92.0
TIR Brightness Temperature (K)
321
318
315
312
309
306
303
300
297
324
320.0
317.5
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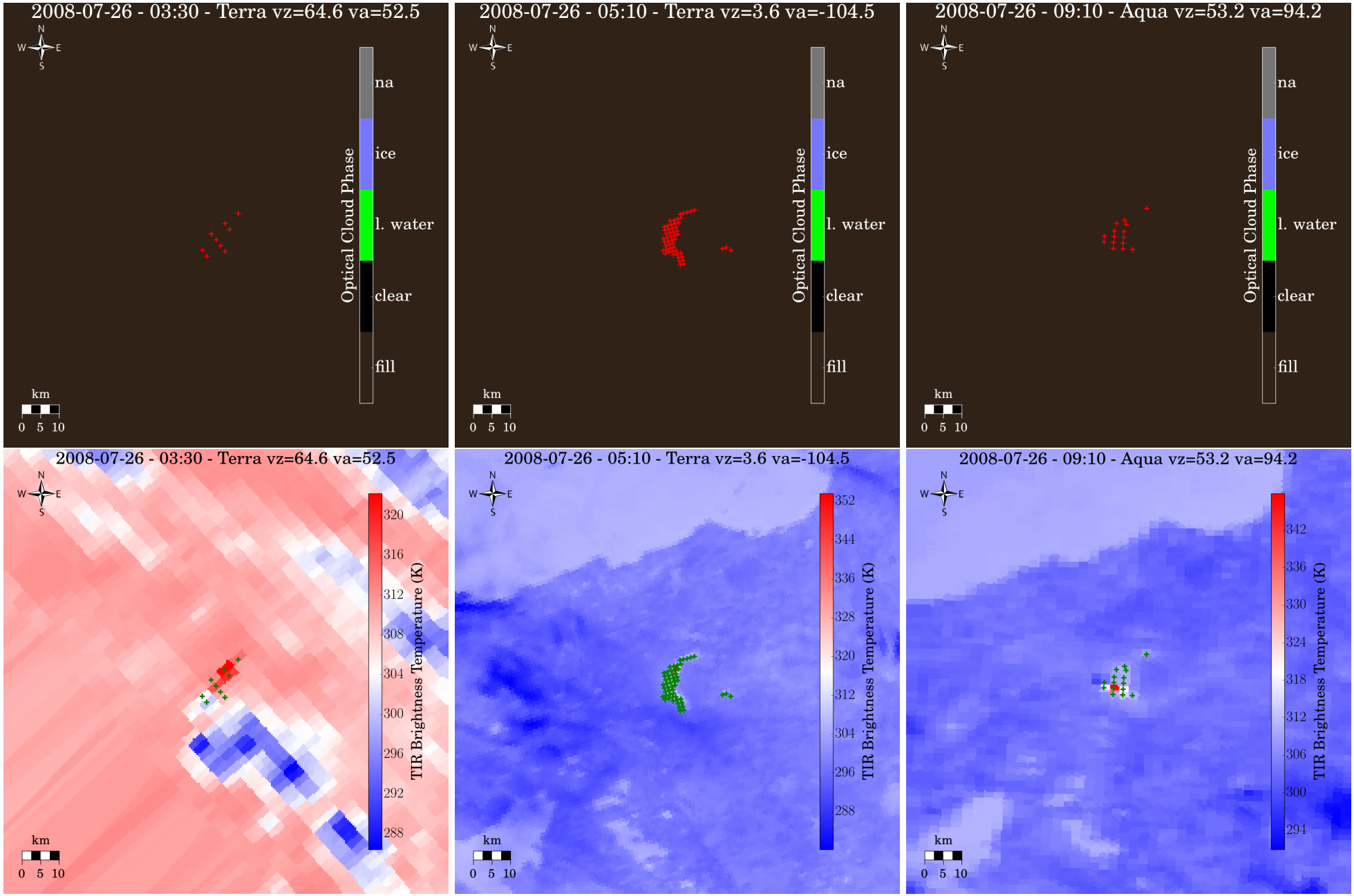
312.5
310.0
307.5
305.0
302.5
300.0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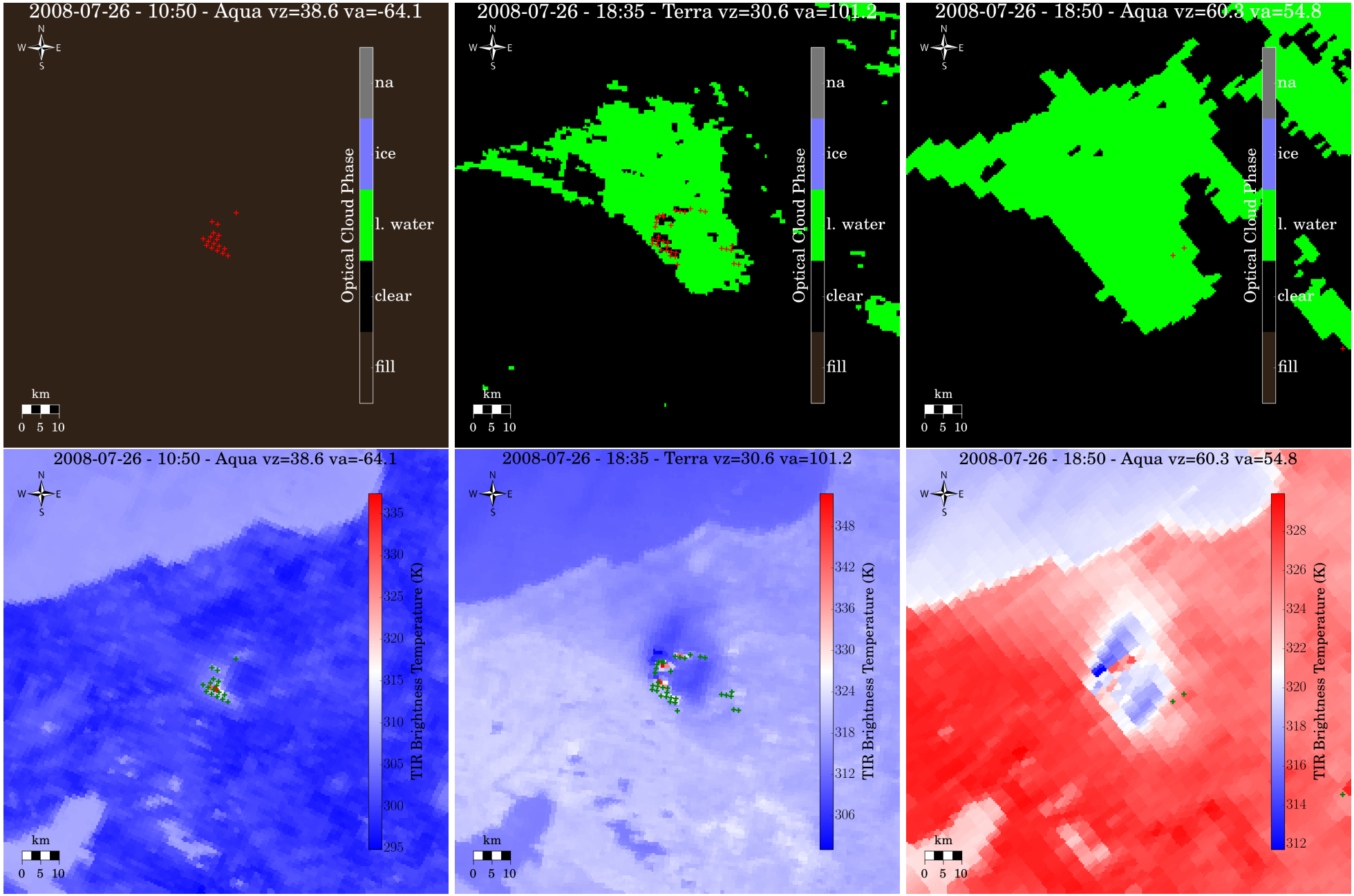
2008-07-26 - 09:10 - Aqua vz=53.2 va=94.2
N
W
E
S
Optical Cloud Phase
na
ice
l. water
clear
fill
km
0 5 10
TIR Brightness Temperature (K)
320
316
312
308
304
300
296
292
288
352
344
336
328
320
312
304
296
288
342
336
330
324
318
312
306
300
294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N
W
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Optical Cloud Phase
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ice
l. water
clear
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km
0 5 10
2008-07-26 - 10:50 - Aqua vz=38.6 va=-64.1
2008-07-26 - 18:35 - Terra vz=30.6 va=101.2
2008-07-26 - 18:50 - Aqua vz=60.3 va=54.8
TIR Brightness Temperature (K)
335
330
325
320
315
310
305
300
295
348
342
336
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306
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326
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318
316
314
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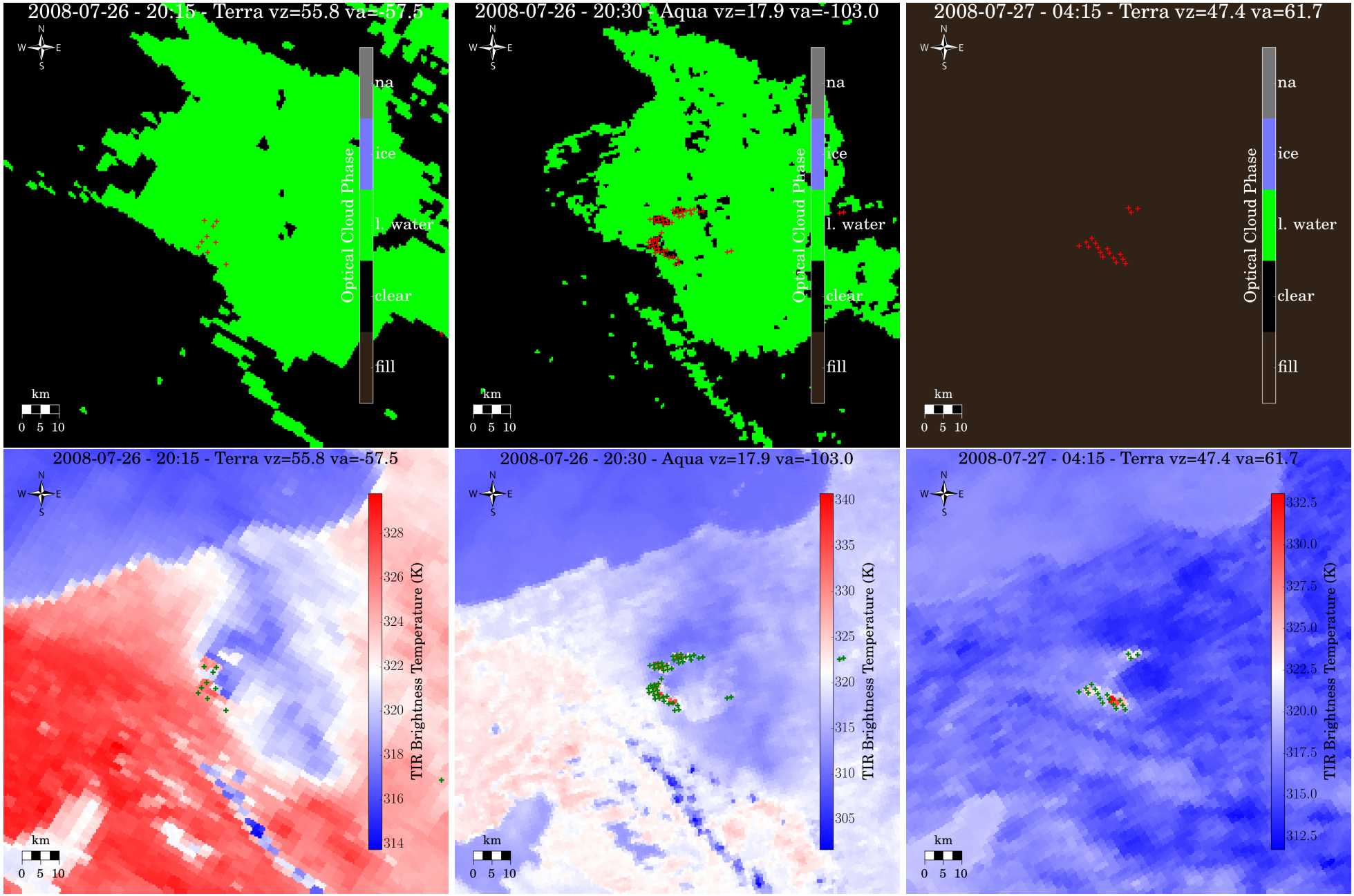
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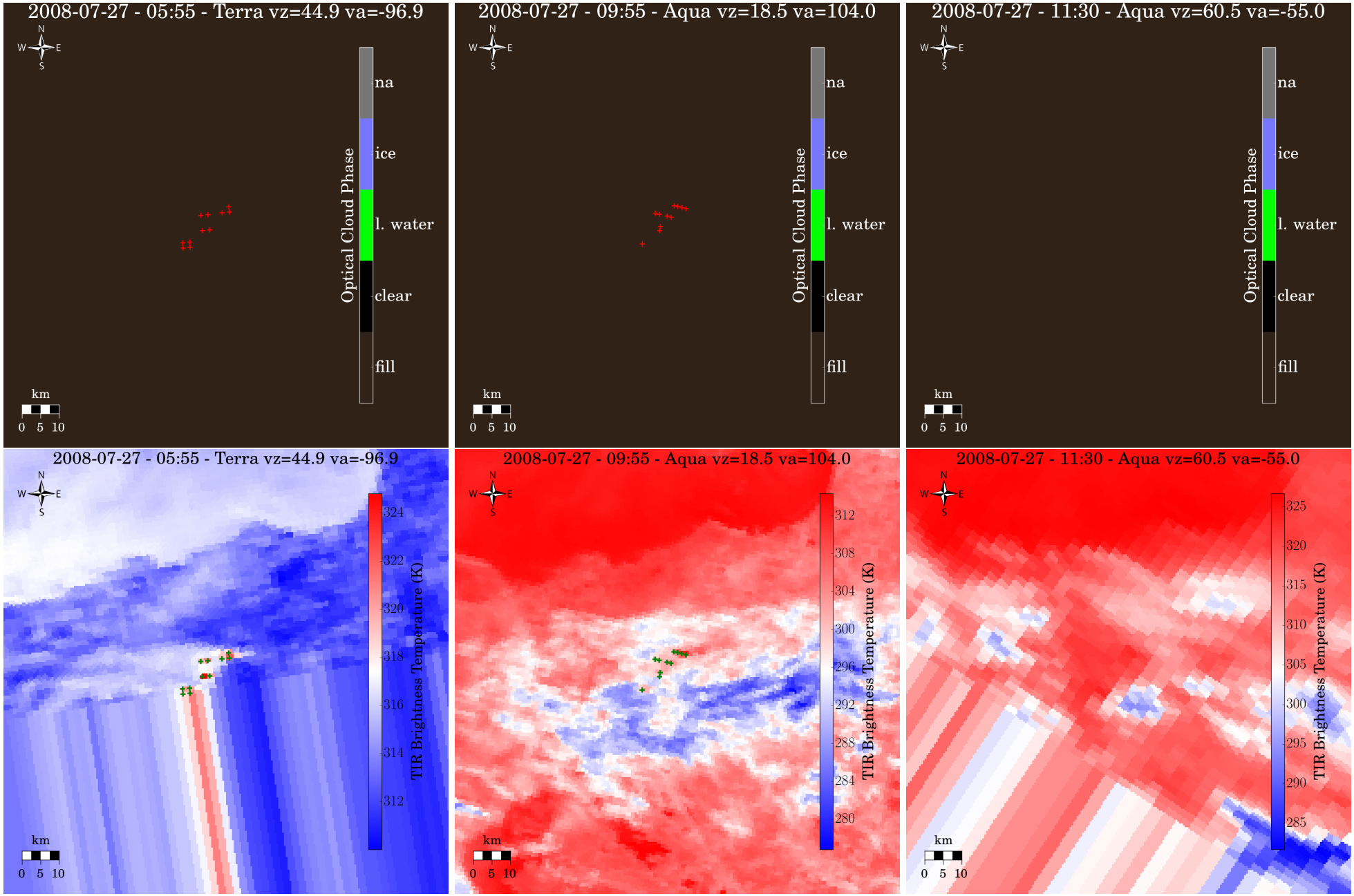
2008-07-27 - 04:15 - Terra vz=47.4 va=61.7
N
W
E
S
Optical Cloud Phase
na
ice
l. water
clear
fill
km
0 5 10
TIR Brightness Temperature (K)
328
326
324
322
320
318
316
314
340
335
330
325
320
315
310
305
332.5
330.0
327.5
325.0
322.5
320.0
317.5
315.0
312.5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N
W
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Optical Cloud Phase
na
ice
l. water
clear
fill
km
0 5 10
TIR Brightness Temperature (K)
324
322
320
318
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308
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300
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292
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280
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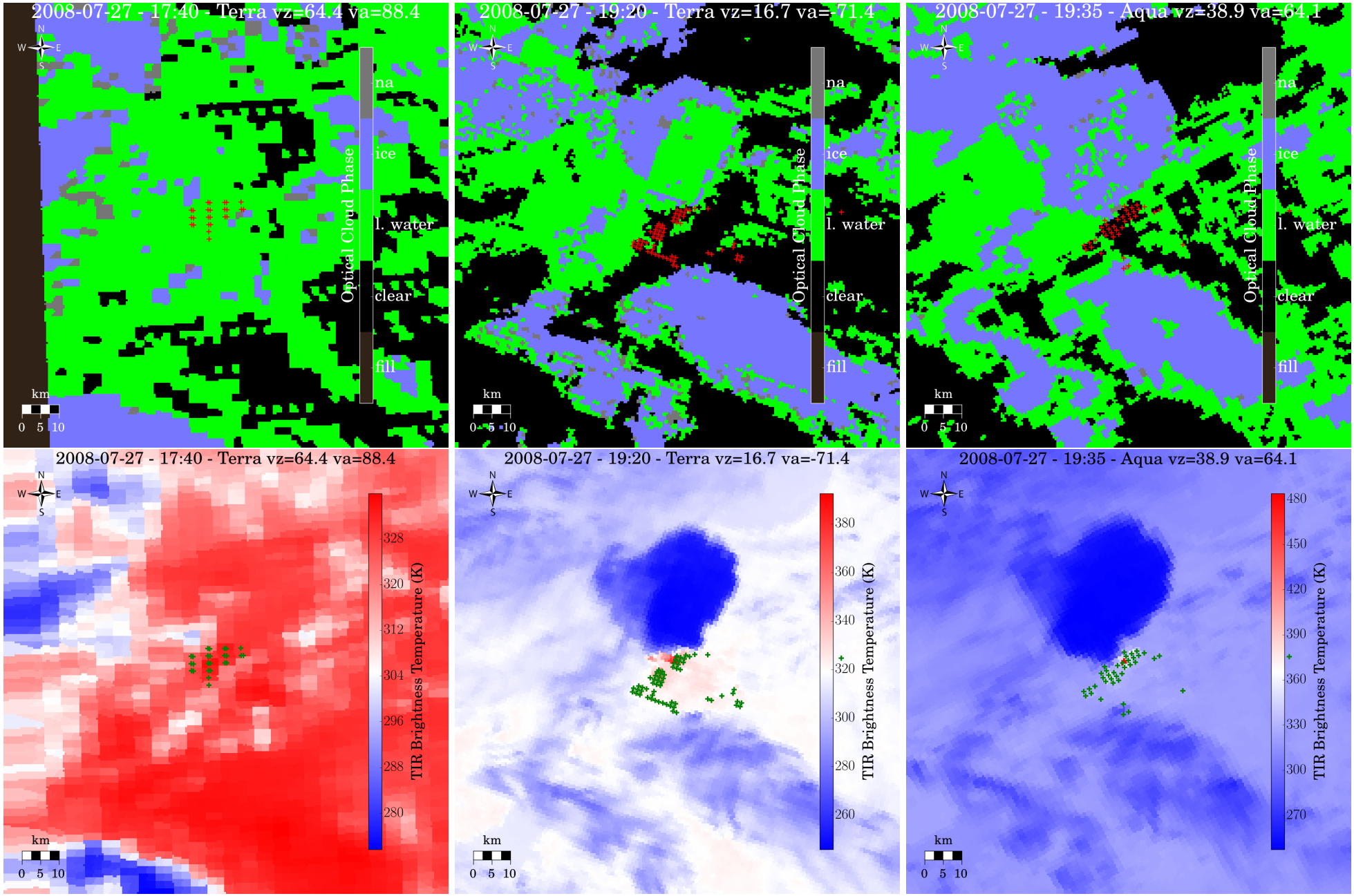
305
295
290
285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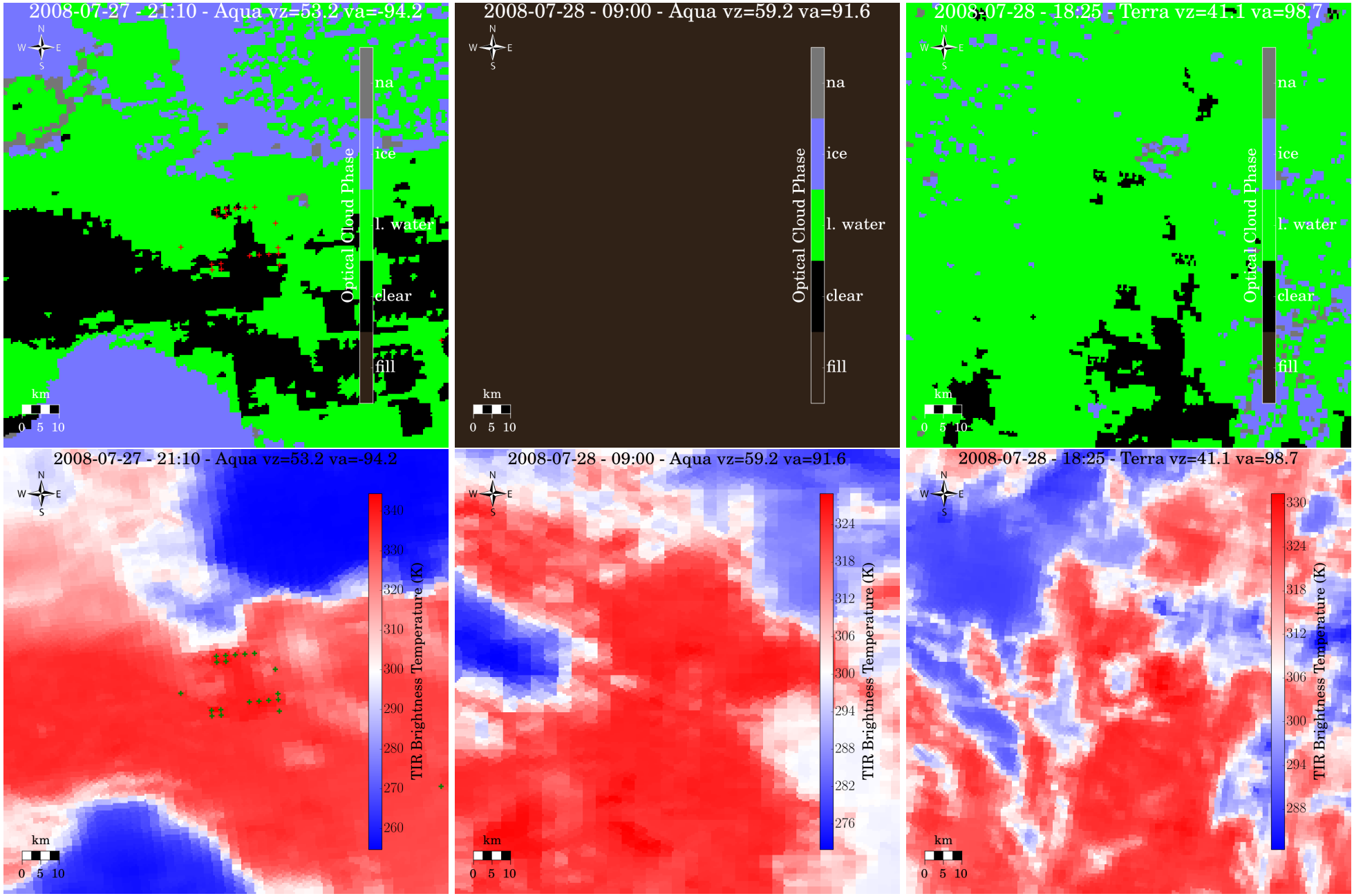
Optical Cloud Phase
na
ice
l. water
clear
fill
TIR Brightness Temperature (K)
328
320
312
304
296
288
280
380
360
340
320
300
280
260
480
450
420
390
360
330
300
270
km
0 5 10
N
W
E
S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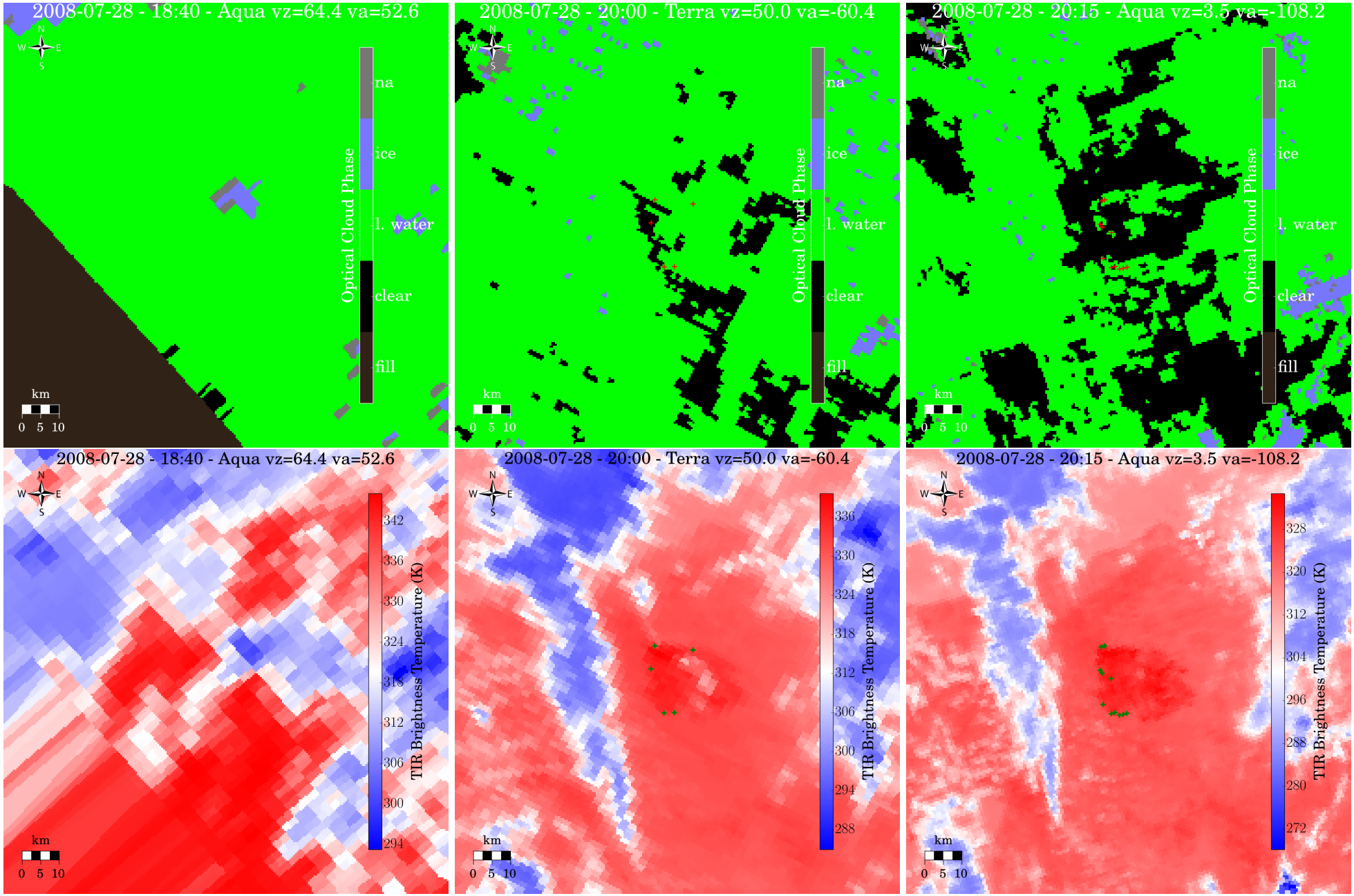
ice
l. water
clear
fill
TIR Brightness Temperature (K)
km
0 5 10
N
W
E
S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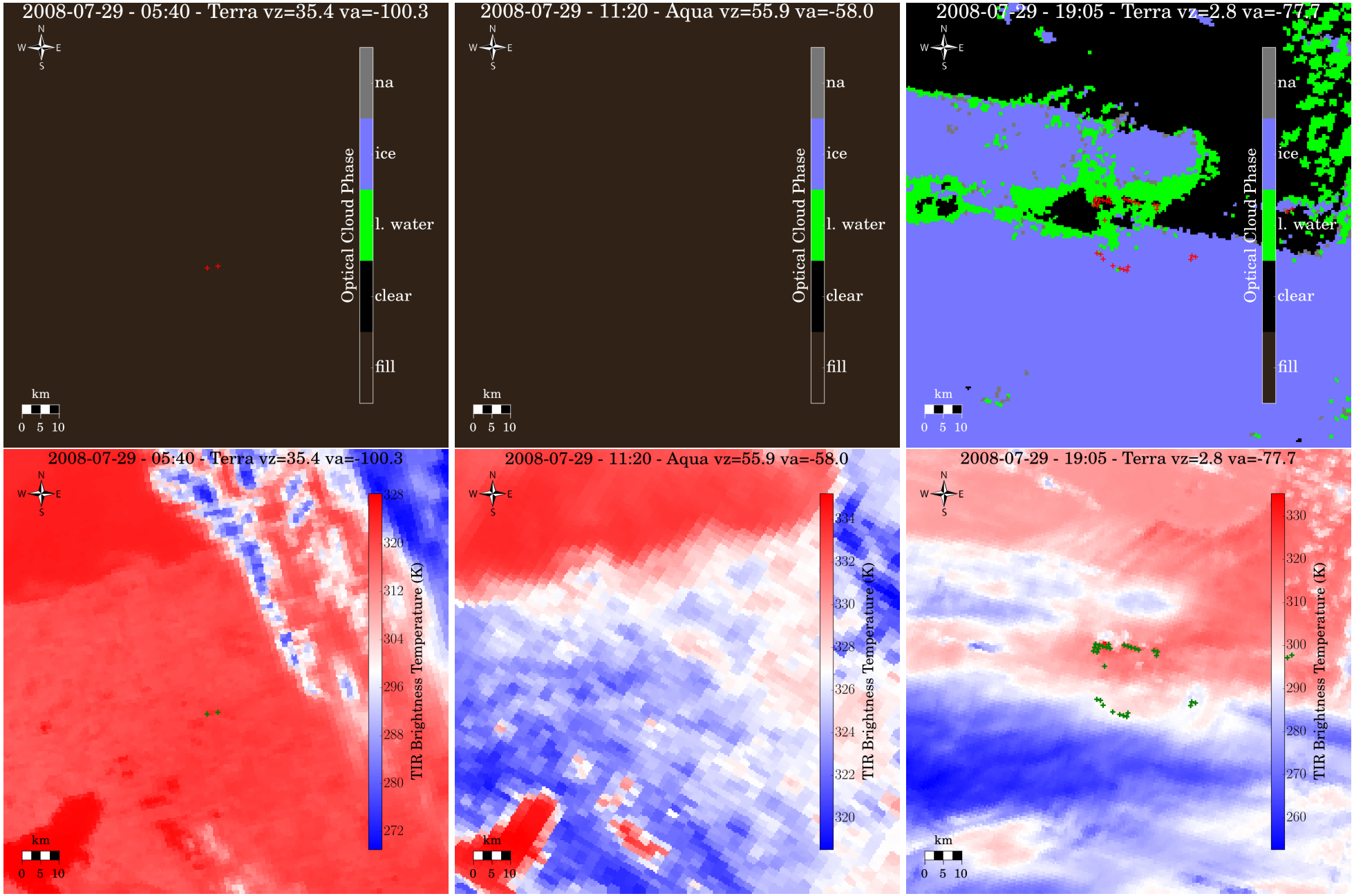
2008-07-28 - 20:15 - Aqua vz=3.5 va=-108.2
Optical Cloud Phase
na
ice
l. water
clear
fill
TIR Brightness Temperature (K)
342
336
330
324
318
312
306
300
294
288
280
272
km
0 5 10
N
W
E
S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N
W
E
S
Optical Cloud Phase
na
ice
l. water
clear
fill
km
0 5 10
2008-07-29 - 05:40 - Terra vz=35.4 va=-100.3
2008-07-29 - 11:20 - Aqua vz=55.9 va=-58.0
2008-07-29 - 19:05 - Terra vz=2.8 va=-77.7
TIR Brightness Temperature (K)
328
320
312
304
296
288
280
272
334
332
330
328
326
324
322
320
330
320
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300
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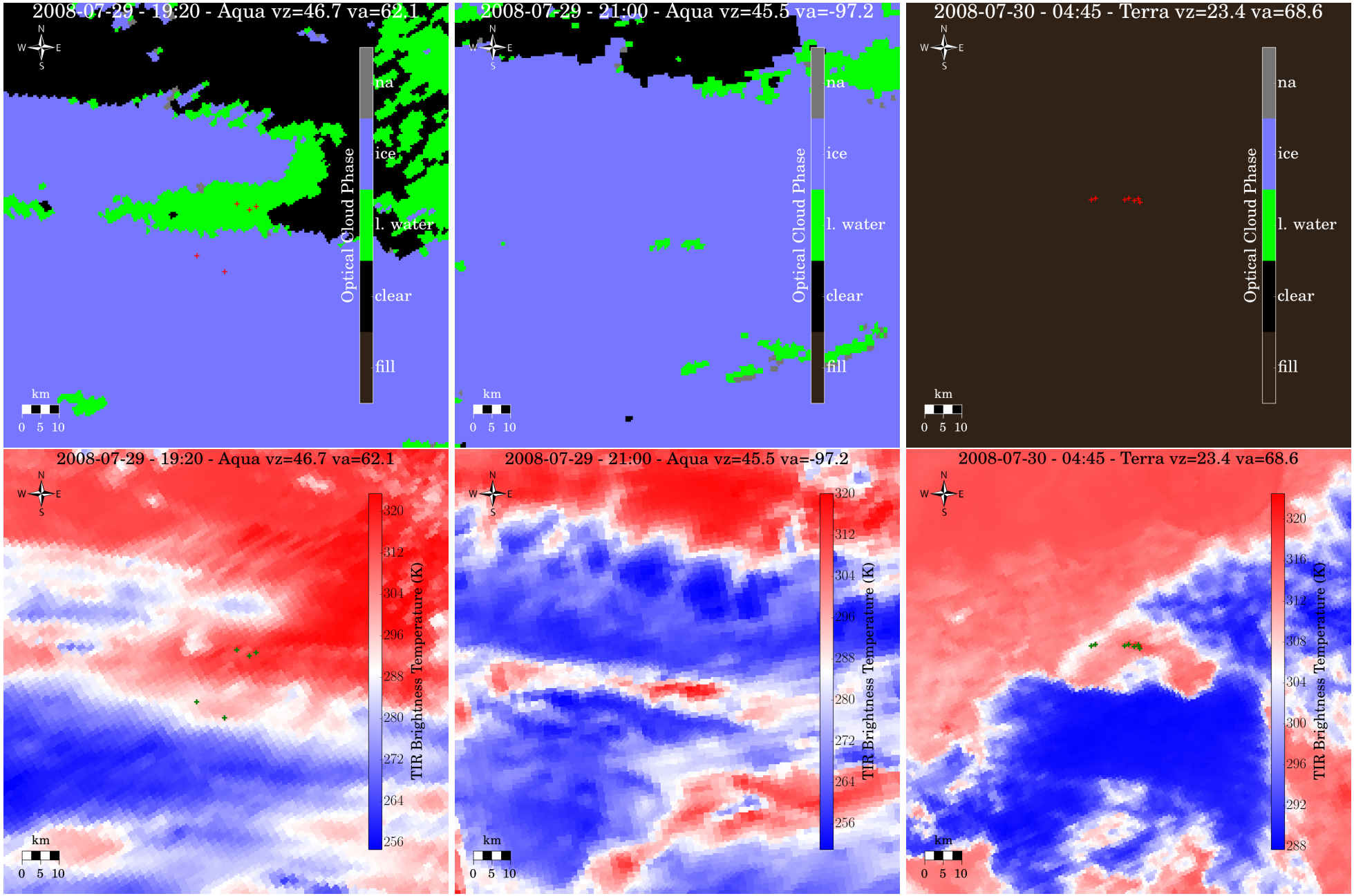
260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N
W
E
S
Optical Cloud Phase
na
ice
l. water
clear
fill
km
0 5 10
TIR Brightness Temperature (K)
320
312
304
296
288
280
272
264
256
316
308
300
292

References

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