The Flights of the ARA Cessna 404 *'Investigator 2'* during NAURU'99

APPENDIX 2: Fluxes, SST, Winds, Clouds and Rain

Jörg M. Hacker and David Pethick

October 1999

ARA Technical Report No. 9/1999

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* Report available from: Dr. J.M. Hacker, ARA-Airborne Research Australia, Flinders University, PO Box 335, Salisbury South, 5106, Australia.

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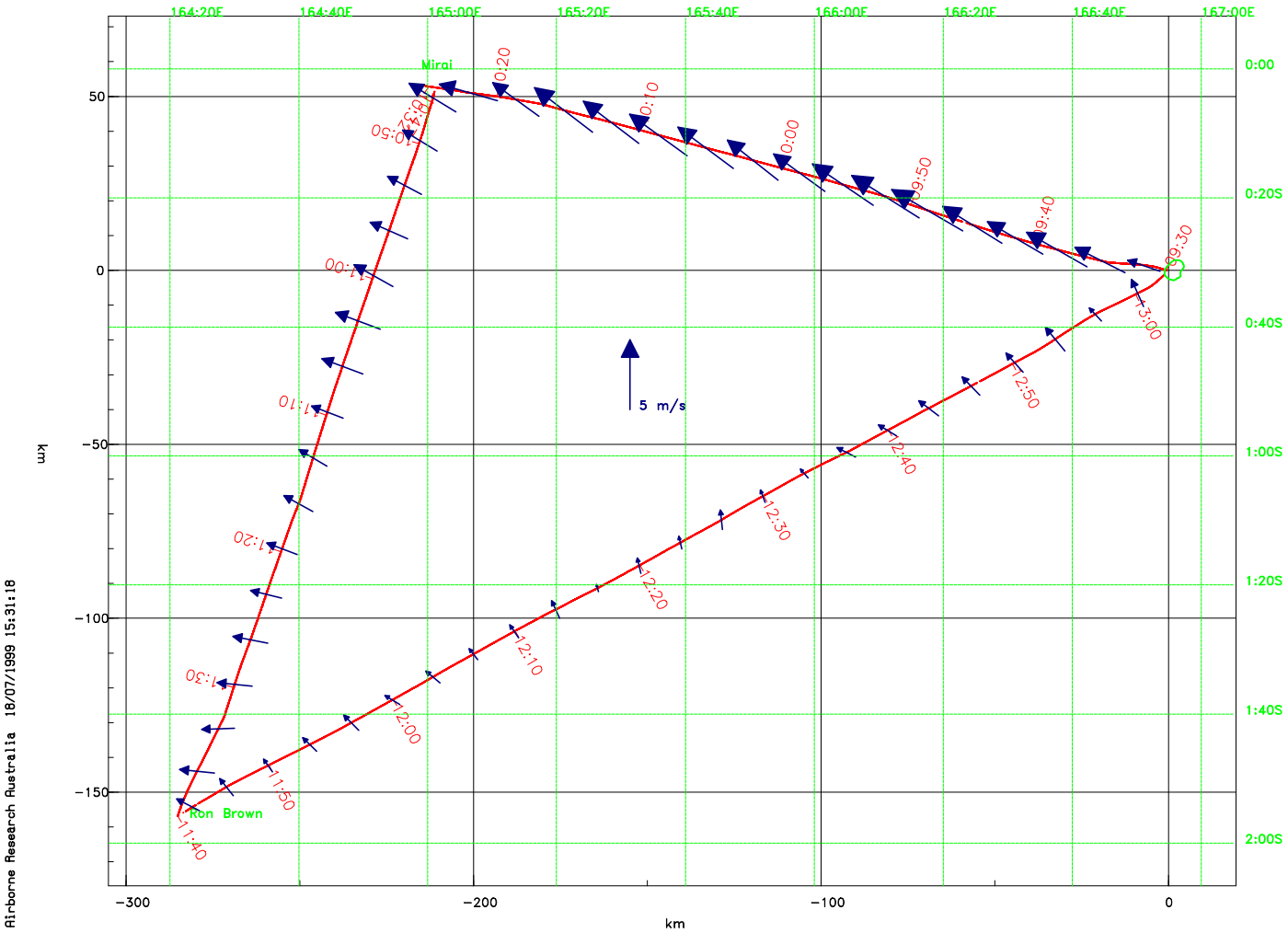
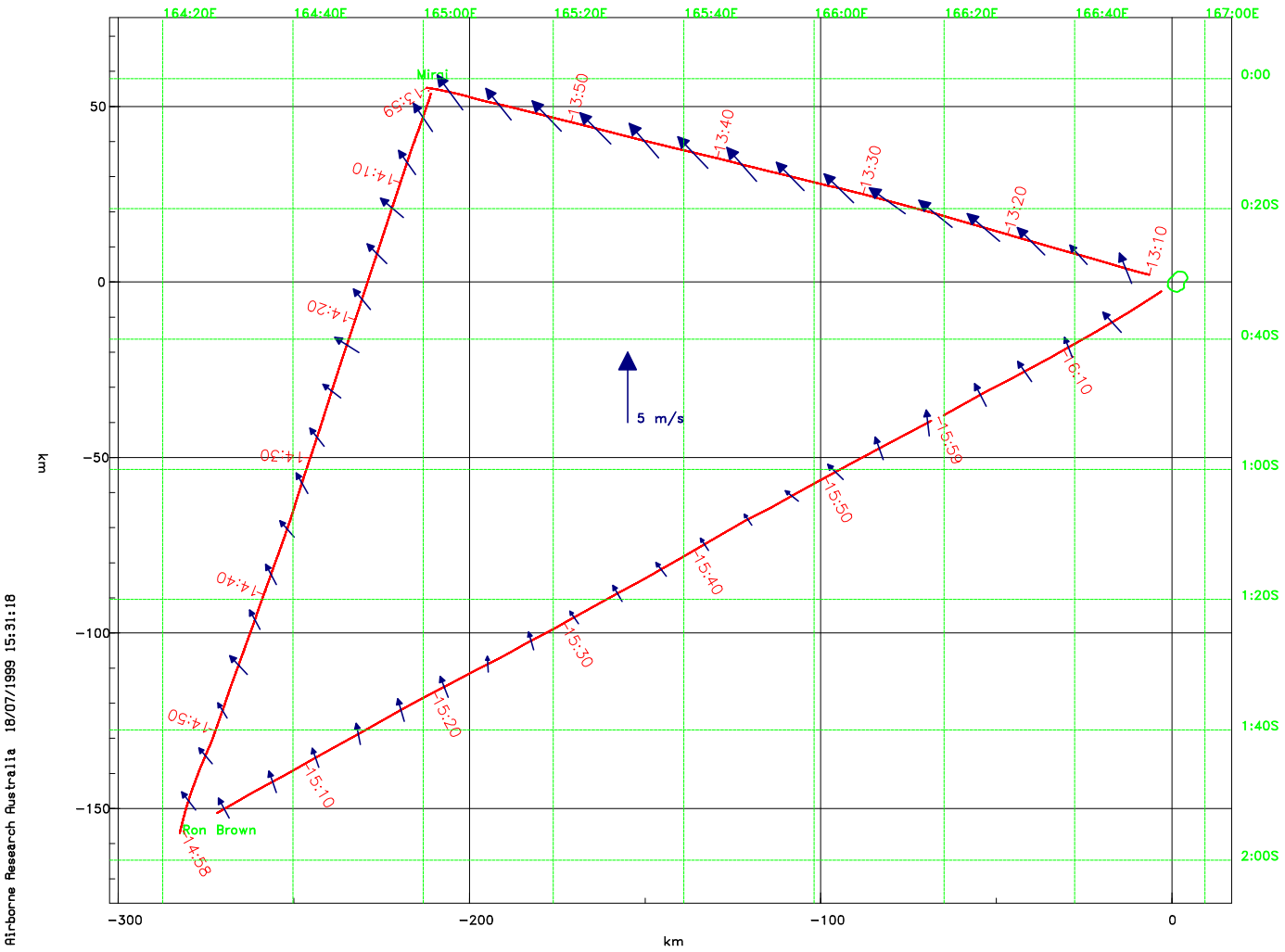
1 Mean winds along the *Big Triangle*

The following figures show mean horizontal winds along the *Big Triangle* pattern averaged over 600 seconds which corresponds to approximately 10km. Arrows show direction and strength of wind. The scale for the length of the arrows is given in the centre of the triangle. Times along the flight track are Local Time. x- and y-distances are relative to the ARC-Site.

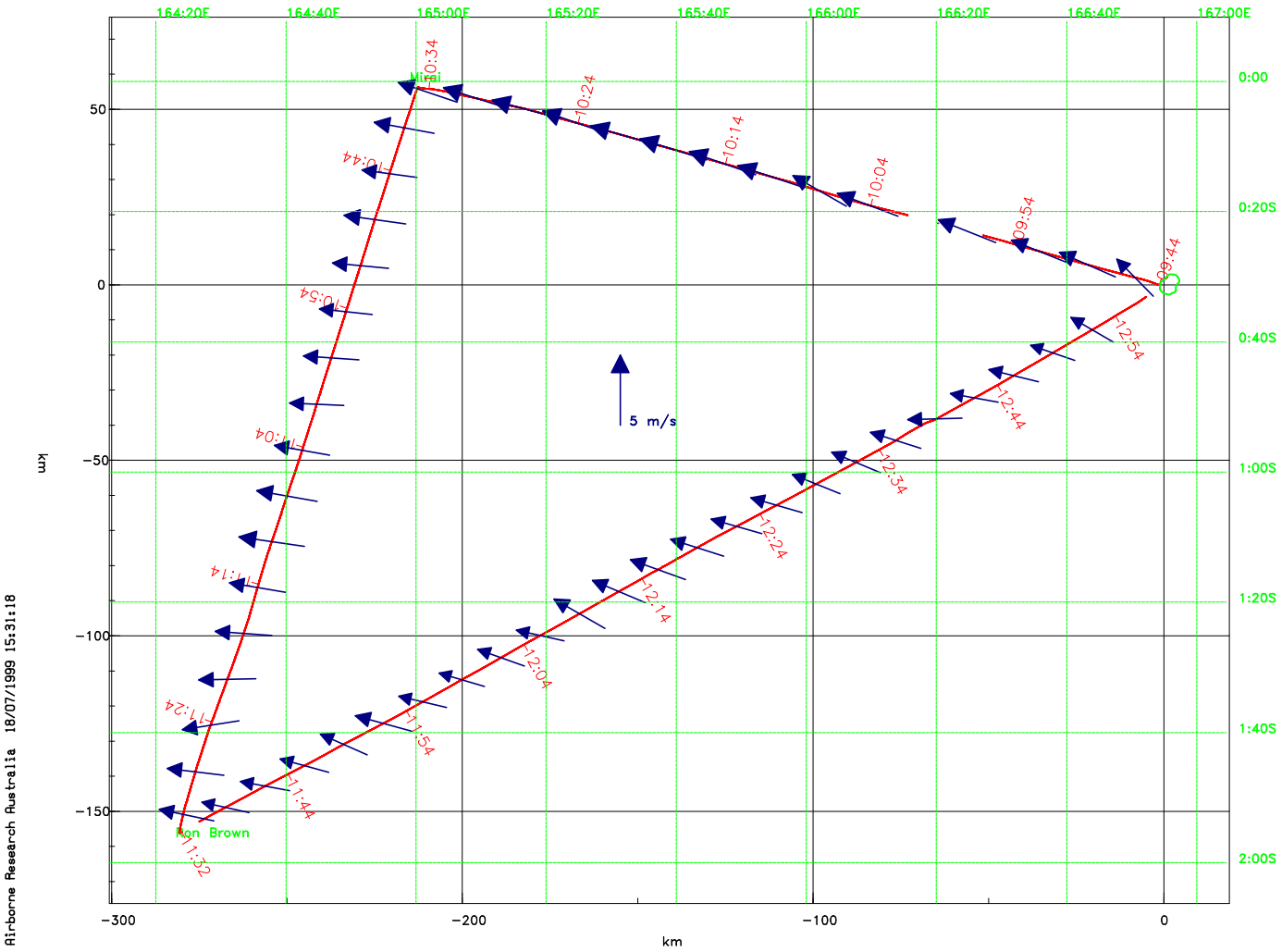
NAURU99 24Jun99 24T1 21:30–01:03UTC
Track, Local Time, Wind; mean flying altitude: 28.9m



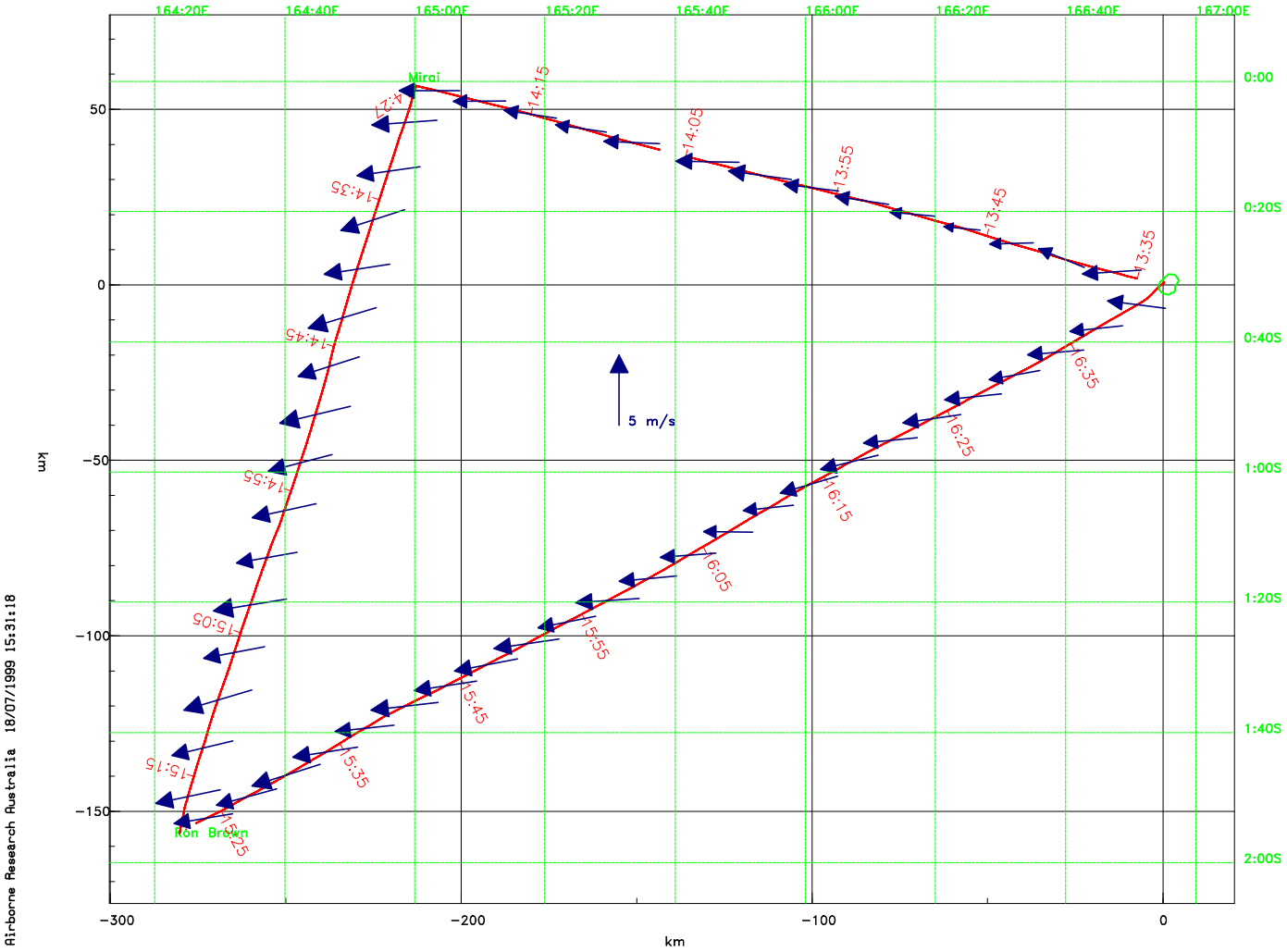
NAURU99 24Jun99 24T2 01:10–04:17UTC
Track, Local Time, Wind; mean flying altitude: 28.7m



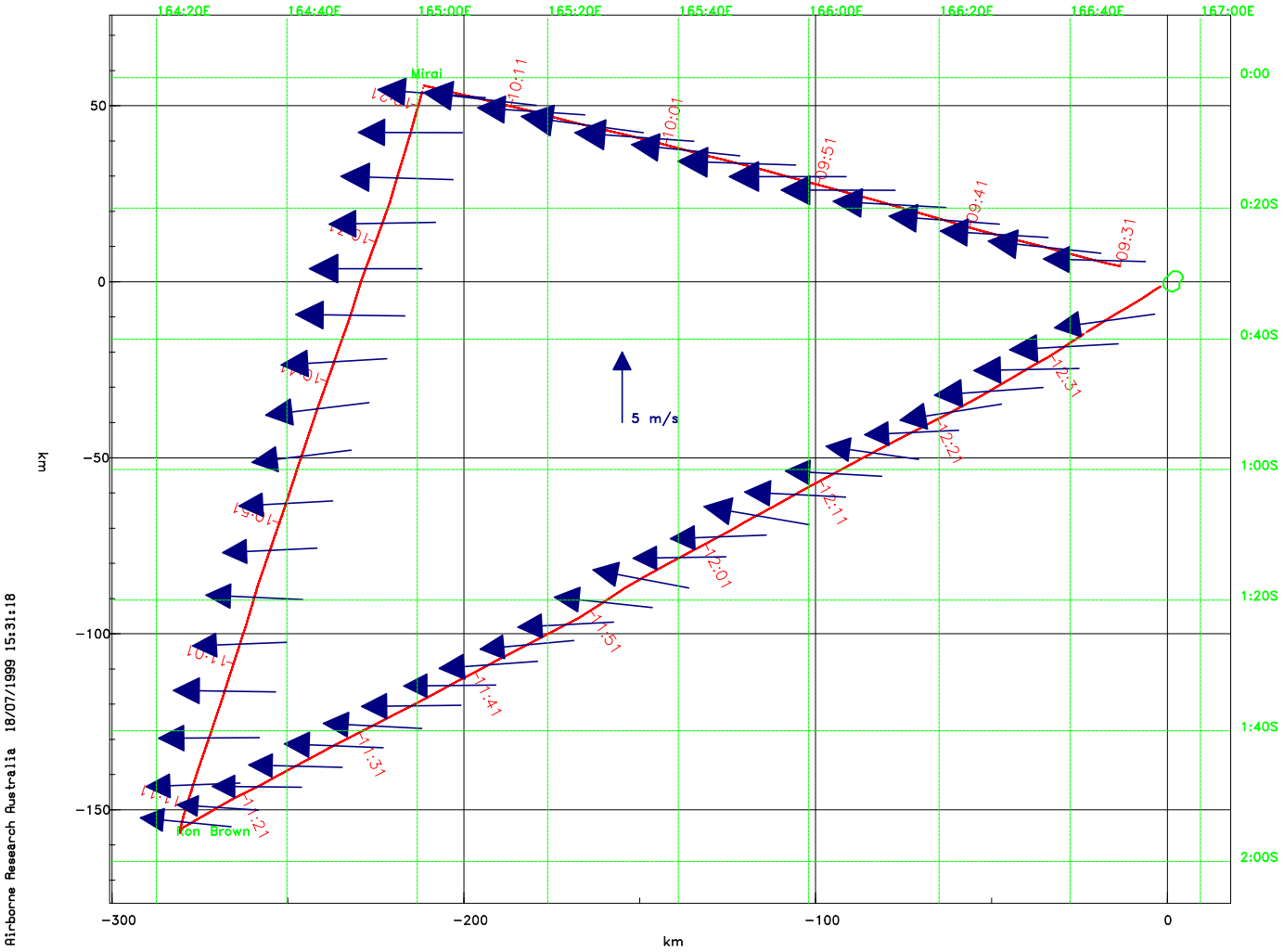
NAURU99 25Jun99 25T1 21:44–00:56UTC
Track, Local Time, Wind; mean flying altitude: 29.6m



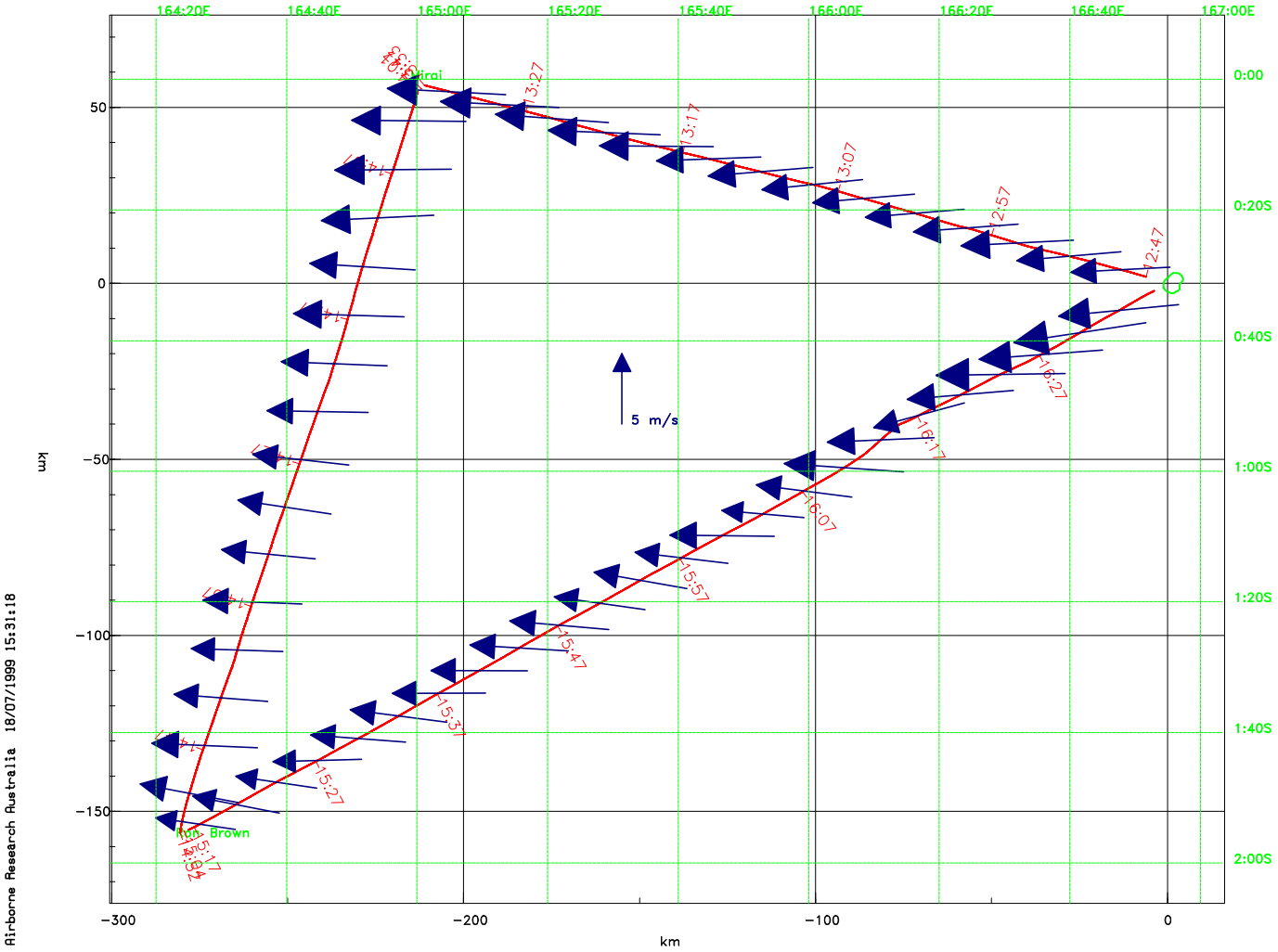
NAURU99 25Jun99 25T2 01:35–04:43UTC
Track, Local Time, Wind; mean flying altitude: 28.6m



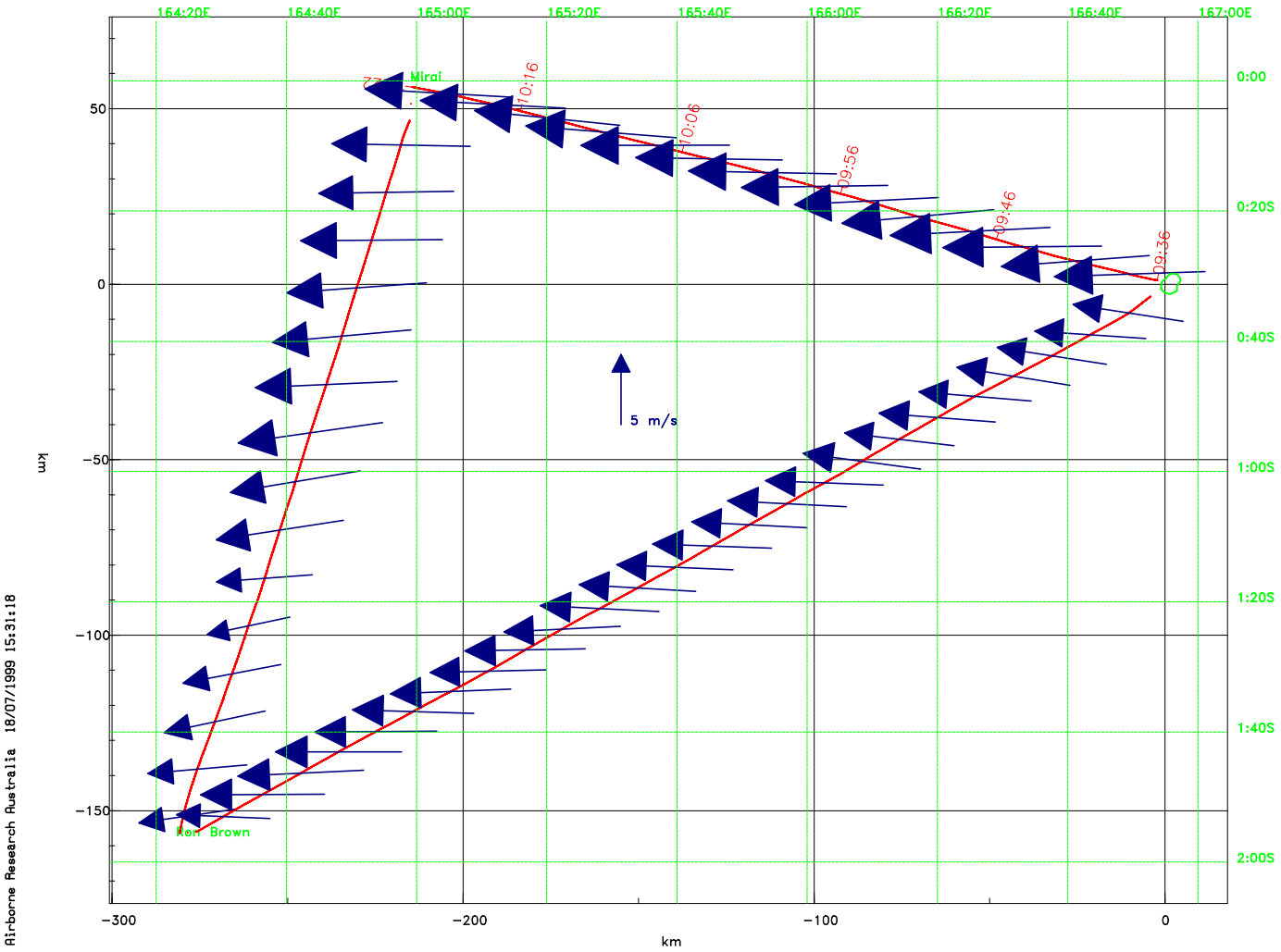
NAURU99 27Jun99 27T1 21:31–00:41UTC
Track, Local Time, Wind; mean flying altitude: 28.9m



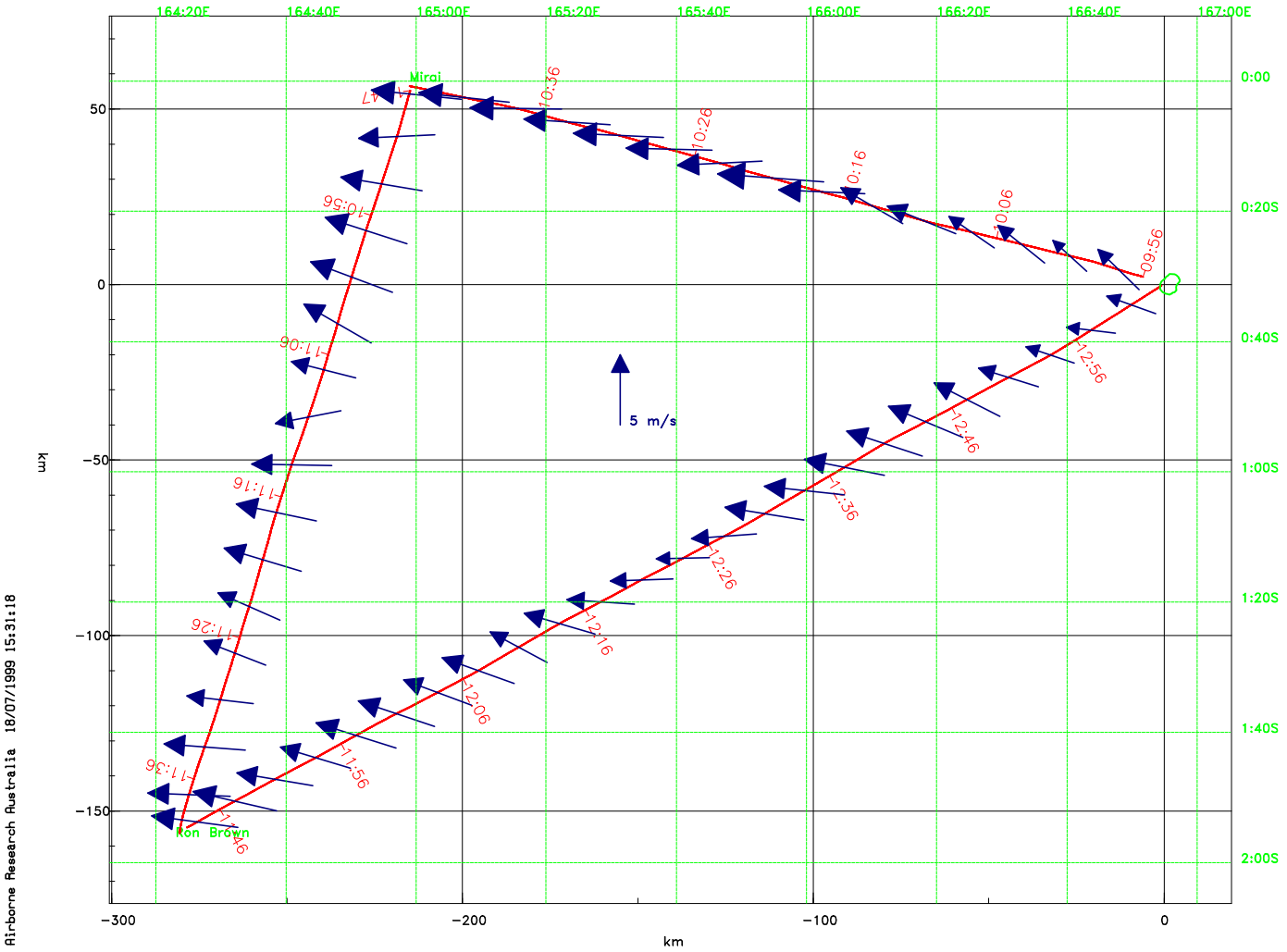
NAURU99 27Jun99 27T2 00:47–04:36UTC
Track, Local Time, Wind; mean flying altitude: 29.2m

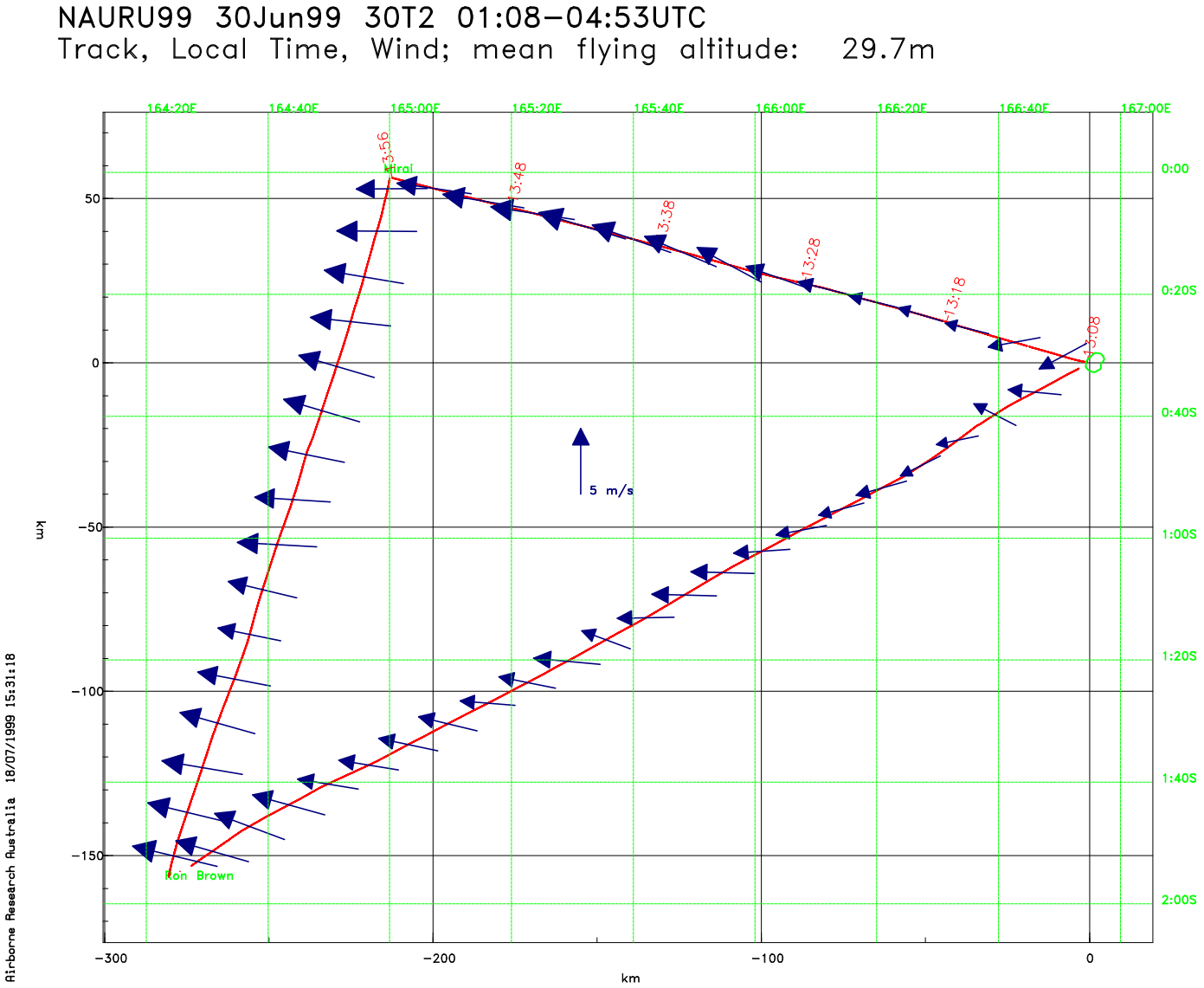


NAURU99 28Jun99 28T1 21:36–02:06UTC
Track, Local Time, Wind; mean flying altitude: 28.7m



NAURU99 30Jun99 30T1 21:56–01:03UTC
Track, Local Time, Wind; mean flying altitude: 29.9m



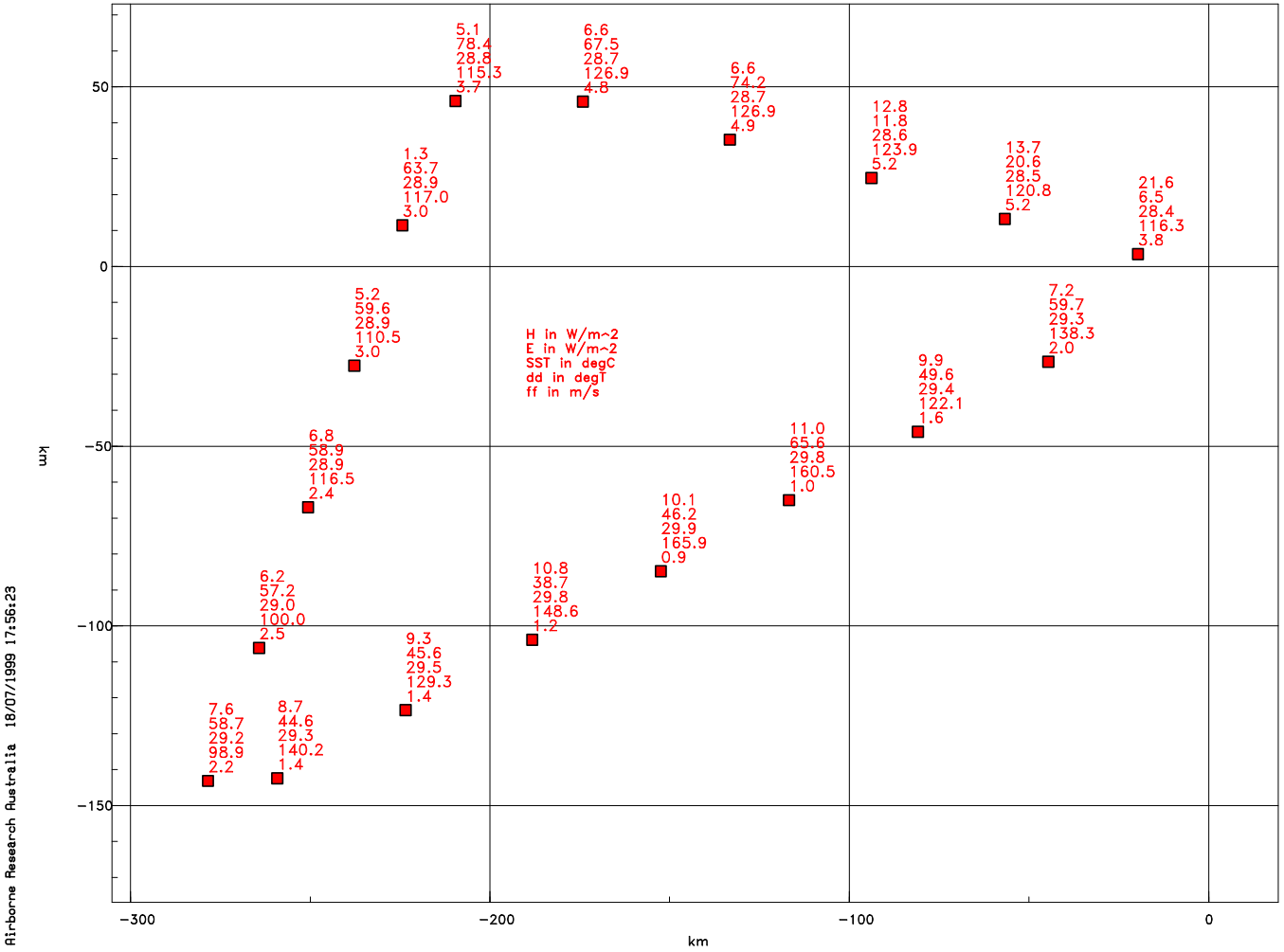

NAURU99 30Jun99 30T2 01:08–04:53UTC
Track, Local Time, Wind; mean flying altitude: 29.7m
164:20E
164:40E
165:00E
165:20E
165:40E
166:00E
166:20E
166:40E
167:00E
0:00
0:20S
0:40S
1:00S
1:20S
1:40S
2:00S
50
0
−50
−100
−150
km
−300
−200
−100
0
km
Mirai
Ron Brown
3:56
3:48
3:38
3:28
3:18
3:08
5 m/s
Airborne Research Australia 18/07/1999 15:31:18

2 Turbulent Fluxes, SST and winds along the *Big Triangle*

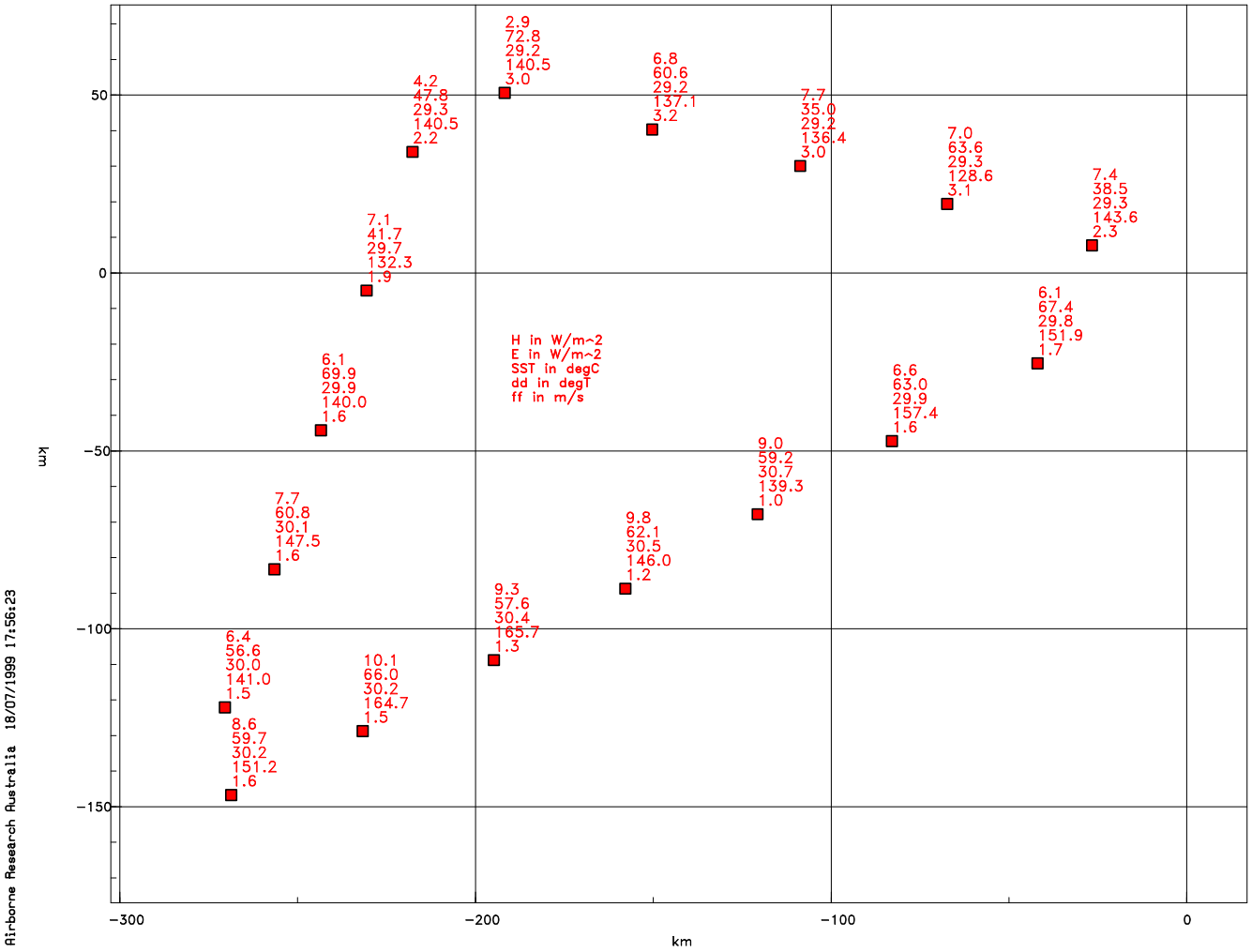
The following figures show averages of vertical turbulent fluxes of sensible (H) and latent energy (E), sea surface temperature (SST) and horizontal wind speed (ff) and direction (dd) along the *Big Triangle* pattern averaged over 600 seconds which corresponds to approximately 40km. x- and y-distances are relative to the ARC-Site.

Fluxes were computed using standard eddy correlation methods, without applying any filtering, but with quadratic detrending of the time series of the fluctuations of temperature, humidity and vertical wind components prior to averaging.

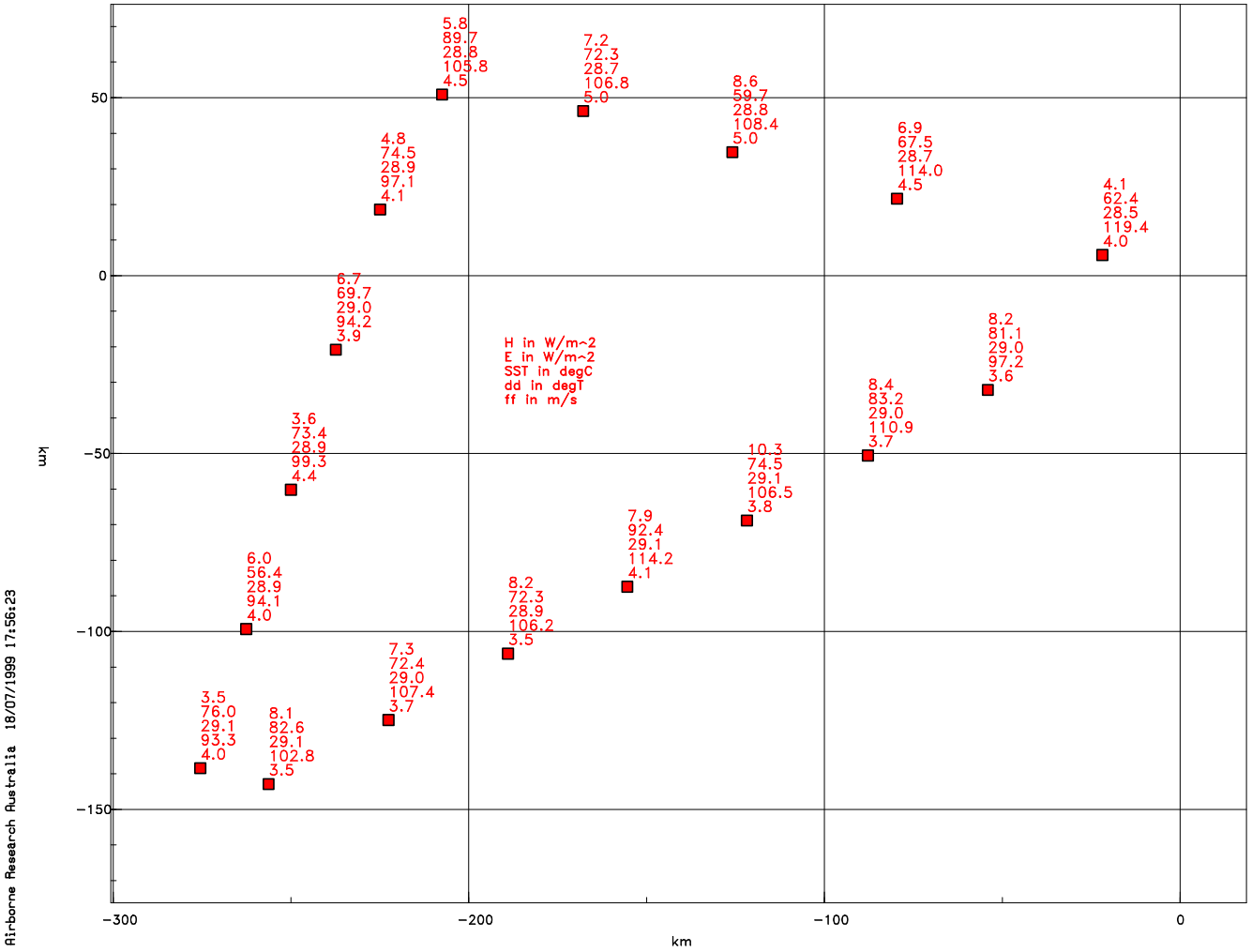
NAURU99 24Jun99 24T1 21:30–01:03UTC
Fluxes (Detrend=Q; HP 0sec), SST, mean wind; averaged over 600sec



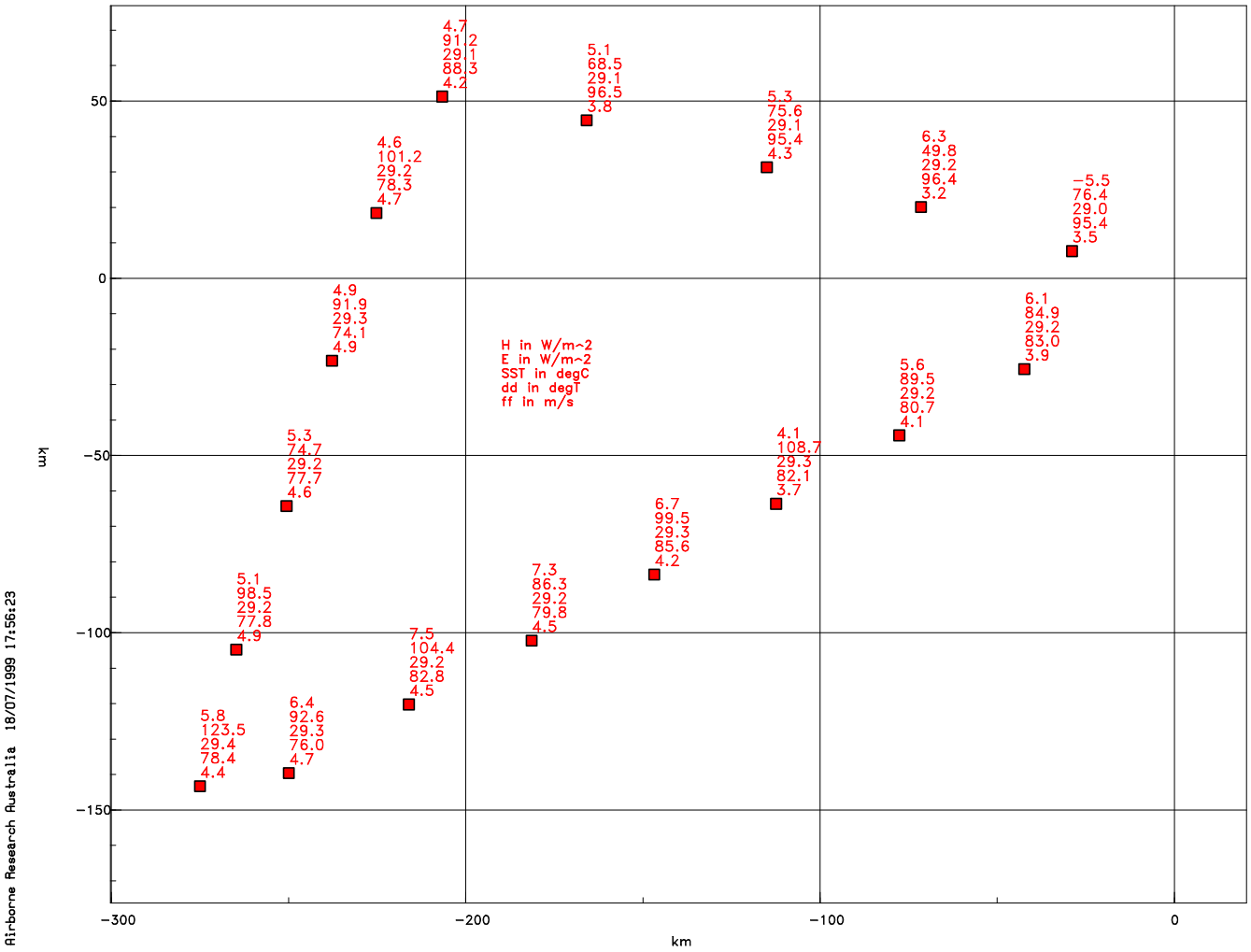
NAURU99 24Jun99 24T2 01:10–04:17UTC
Fluxes (Detrend=Q; HP 0sec), SST, mean wind; averaged over 600sec



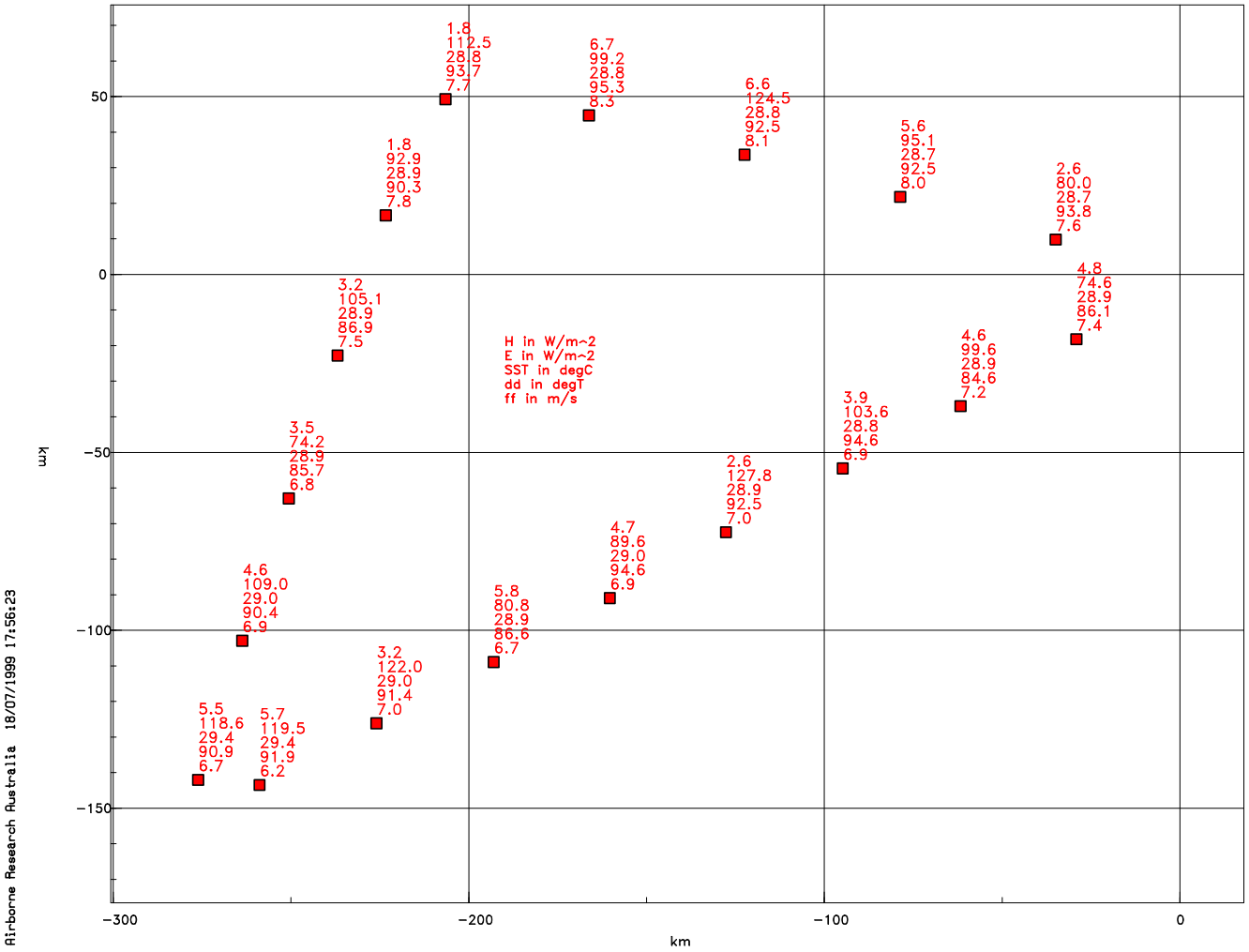
NAURU99 25Jun99 25T1 21:44–00:56UTC
Fluxes (Detrend=Q; HP 0sec), SST, mean wind; averaged over 600sec



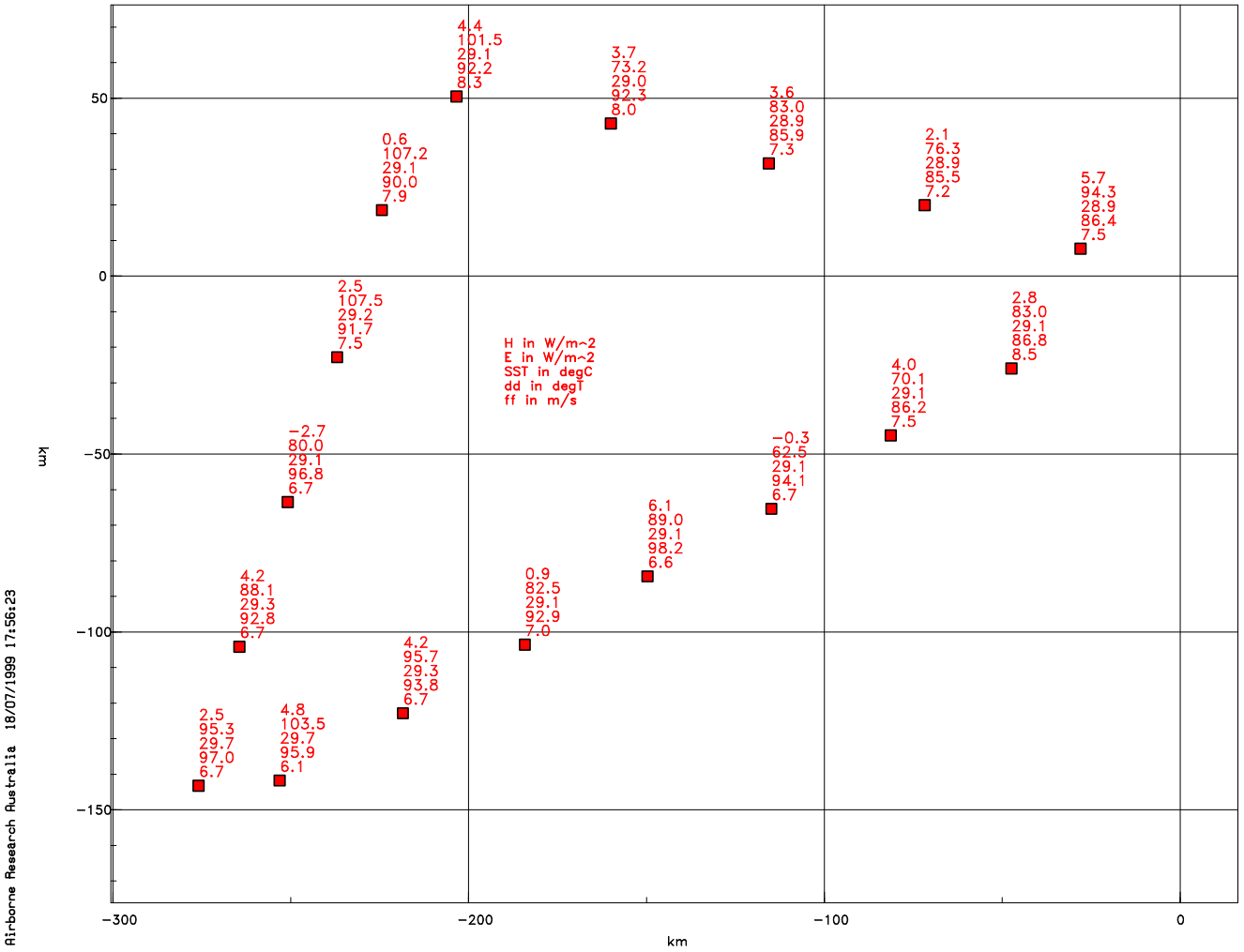
NAURU99 25Jun99 25T2 01:35–04:43UTC
Fluxes (Detrend=Q; HP 0sec), SST, mean wind; averaged over 600sec



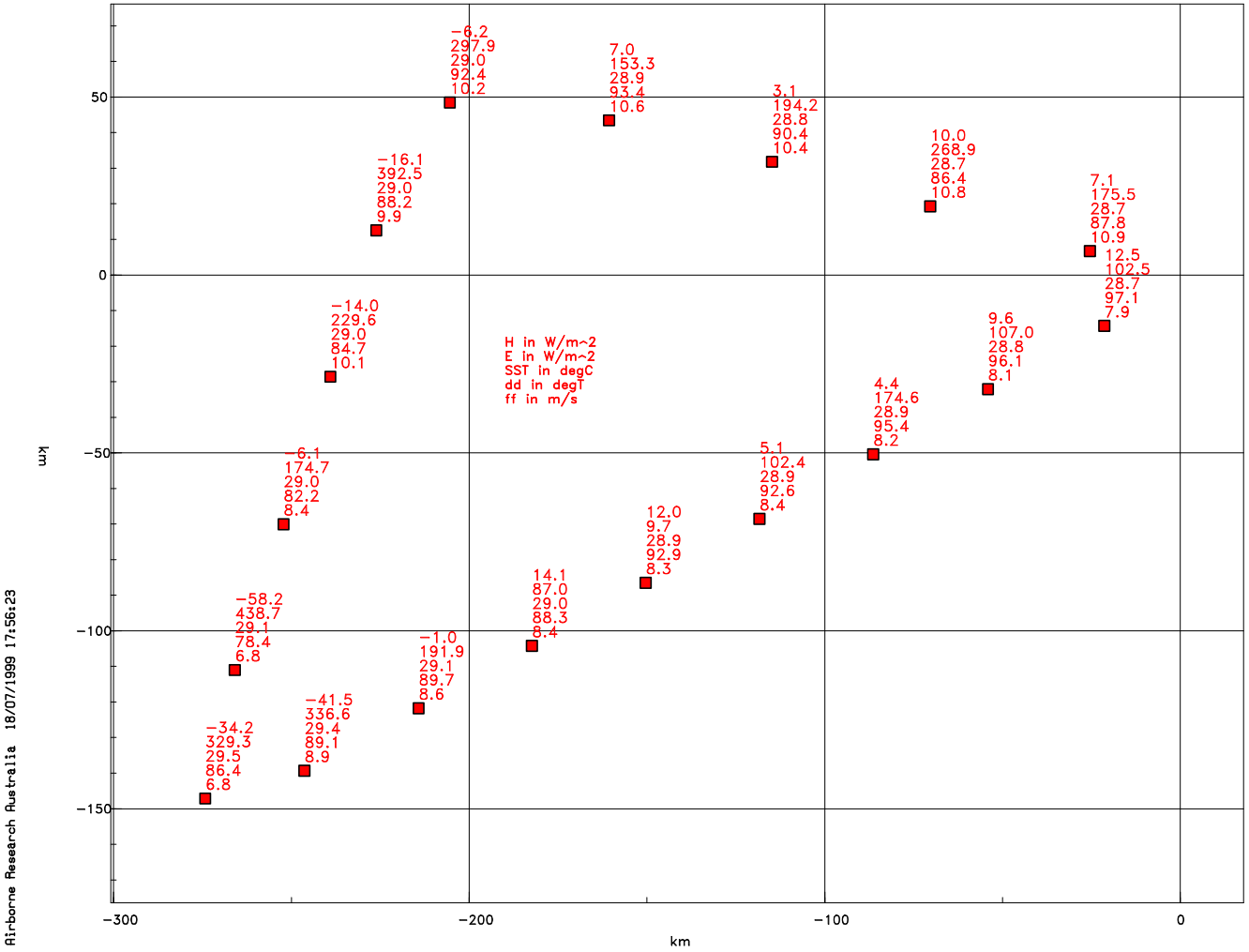
NAURU99 27Jun99 27T1 21:31–00:41UTC
Fluxes (Detrend=Q; HP 0sec), SST, mean wind; averaged over 600sec



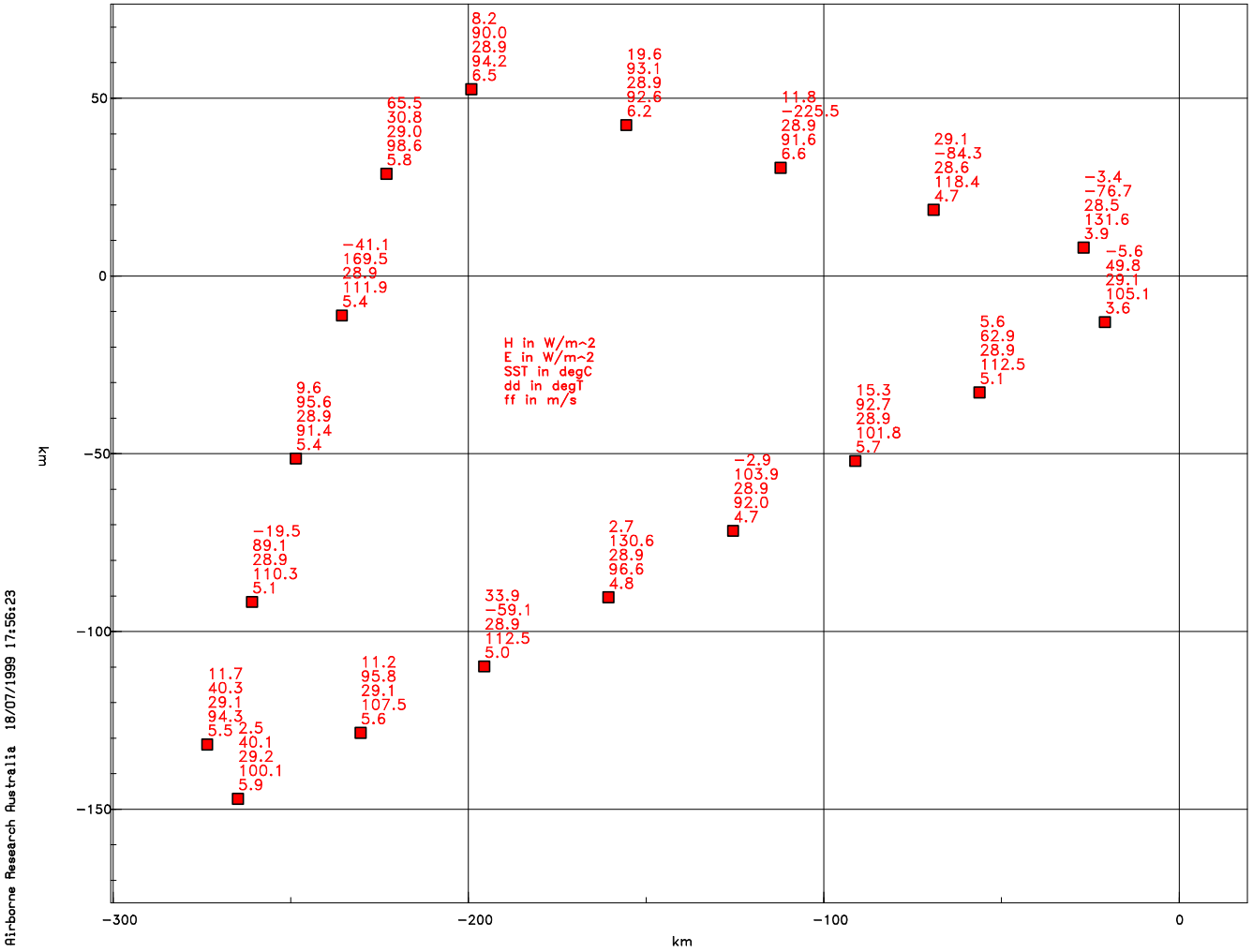
NAURU99 27Jun99 27T2 00:47–04:36UTC
Fluxes (Detrend=Q; HP 0sec), SST, mean wind; averaged over 600sec



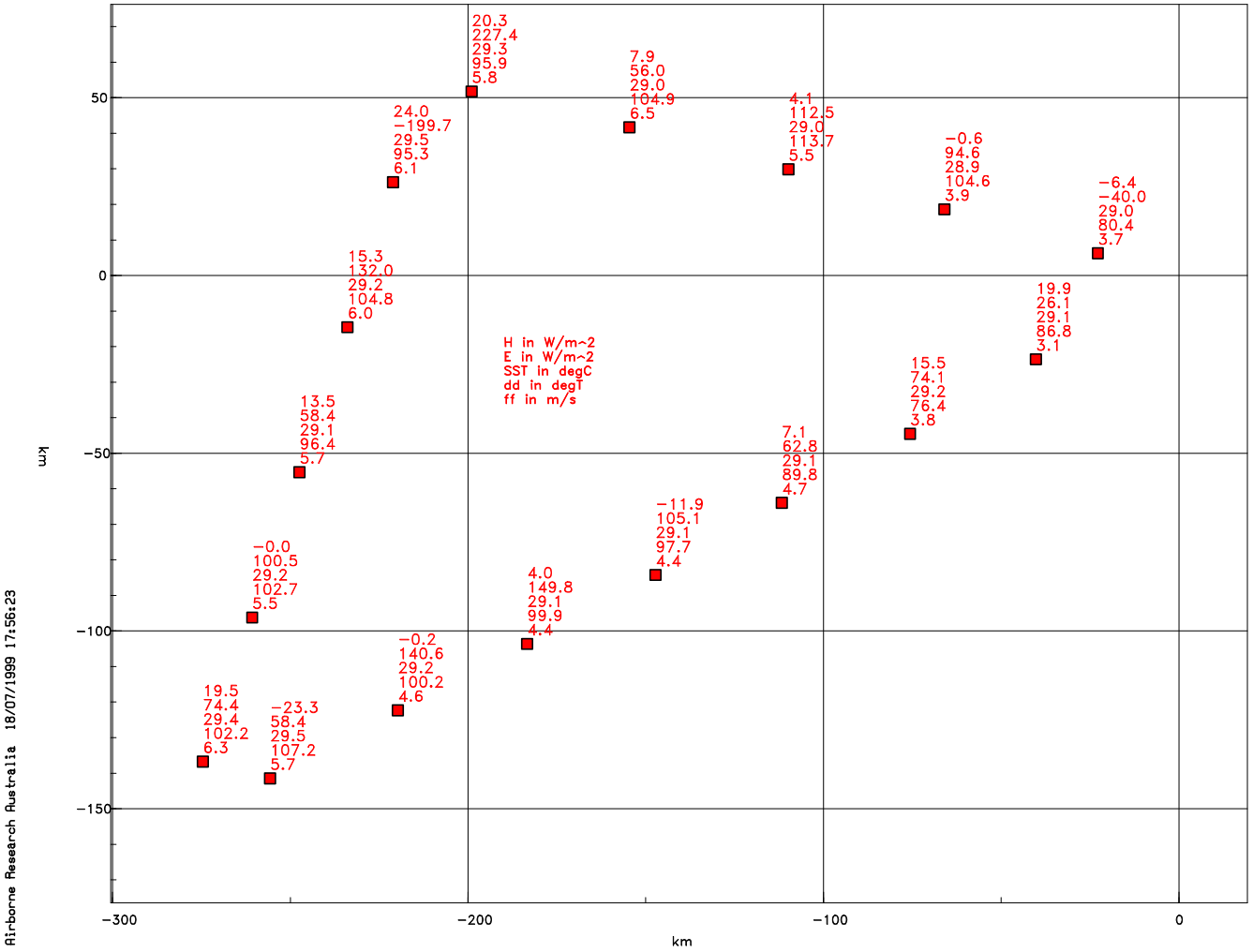
NAURU99 28Jun99 28T1 21:36–02:06UTC
Fluxes (Detrend=Q; HP 0sec), SST, mean wind; averaged over 600sec



NAURU99 30Jun99 30T1 21:56–01:03UTC
Fluxes (Detrend=Q; HP 0sec), SST, mean wind; averaged over 600sec



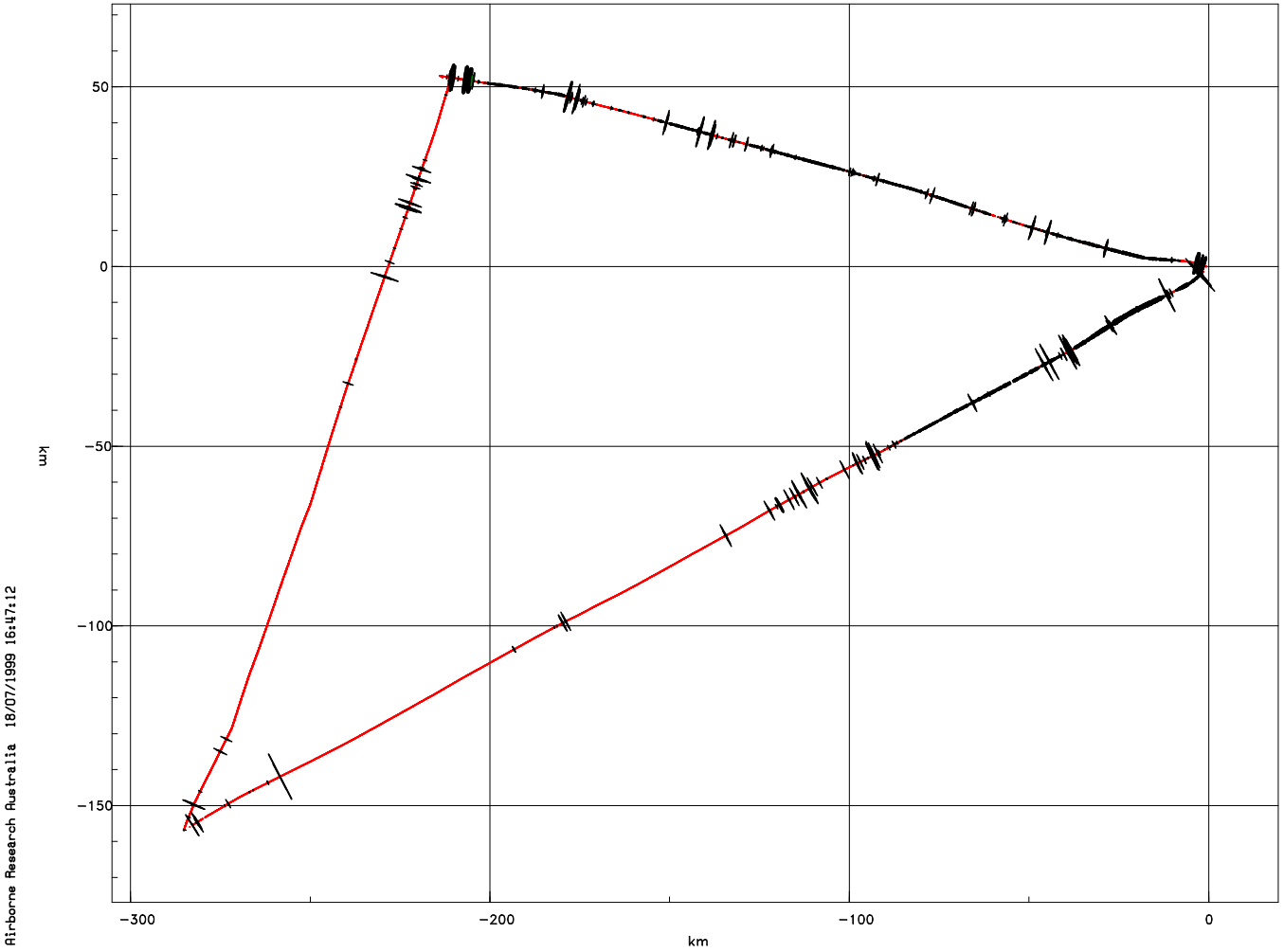
NAURU99 30Jun99 30T2 01:08–04:53UTC
Fluxes (Detrend=Q; HP 0sec), SST, mean wind; averaged over 600sec



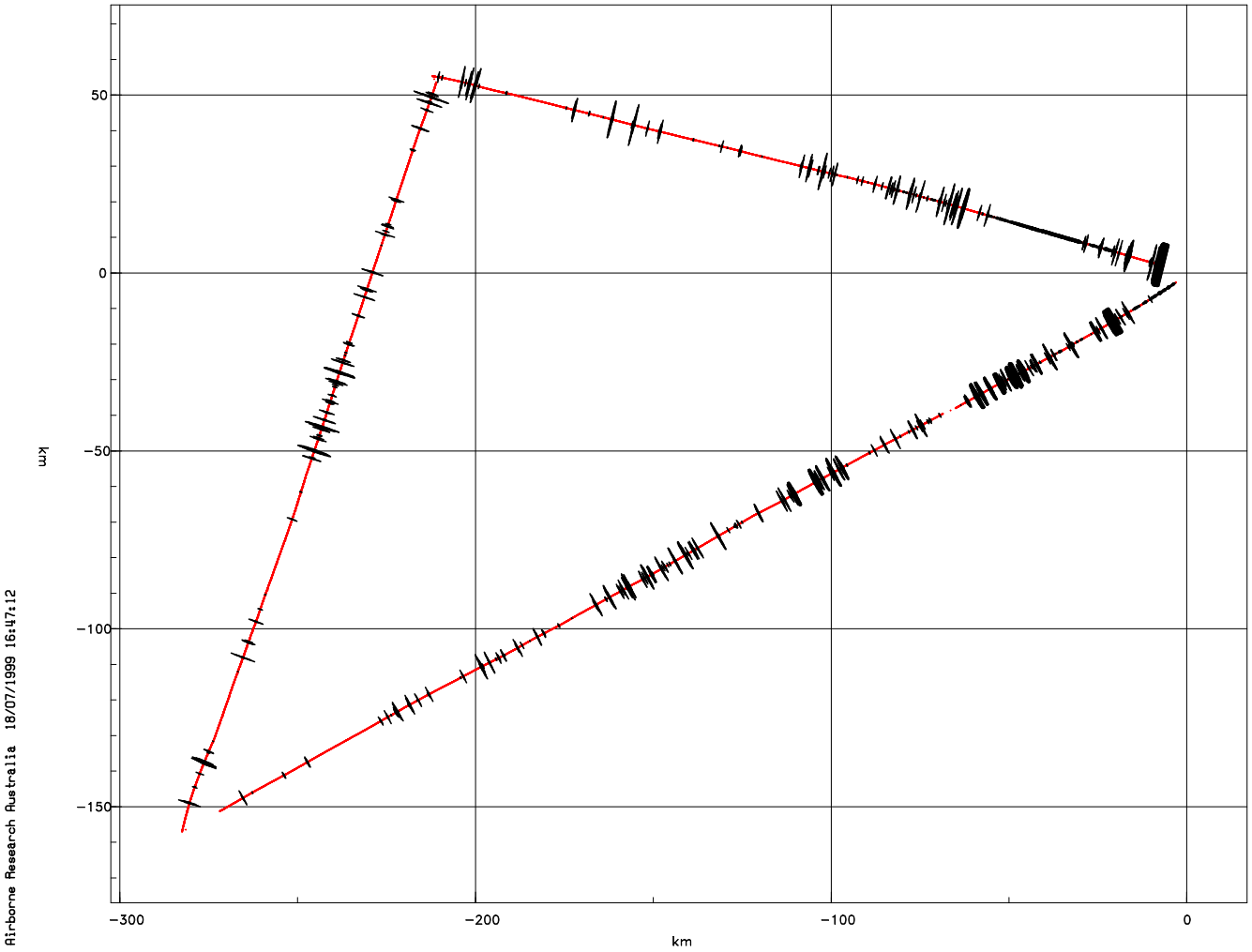
3 Clouds and Rain along the *Big Triangle*

The following figures show a schematic depiction of cloudiness and rainfall along the *Big Triangle* pattern. Shortwave incoming radiation was used to indicate cloudiness, the difference between temperature measurements from the two sensors on the aircraft was used to determine the presence of rain drops. x- and y-distances are relative to the ARC-Site.

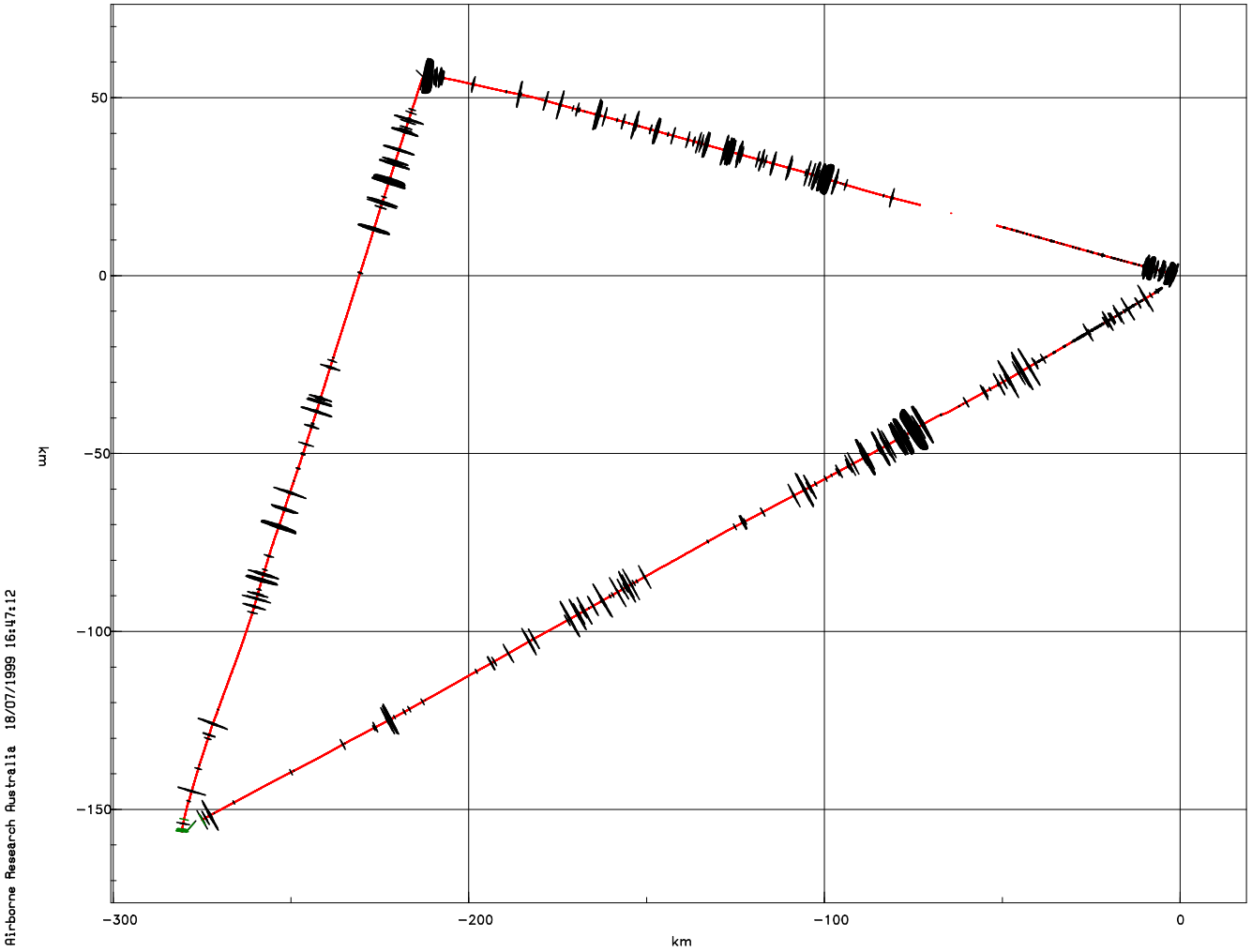
NAURU99 24Jun99 24T1 21:30–01:03UTC
Cloud (black) and rain (green) indicator



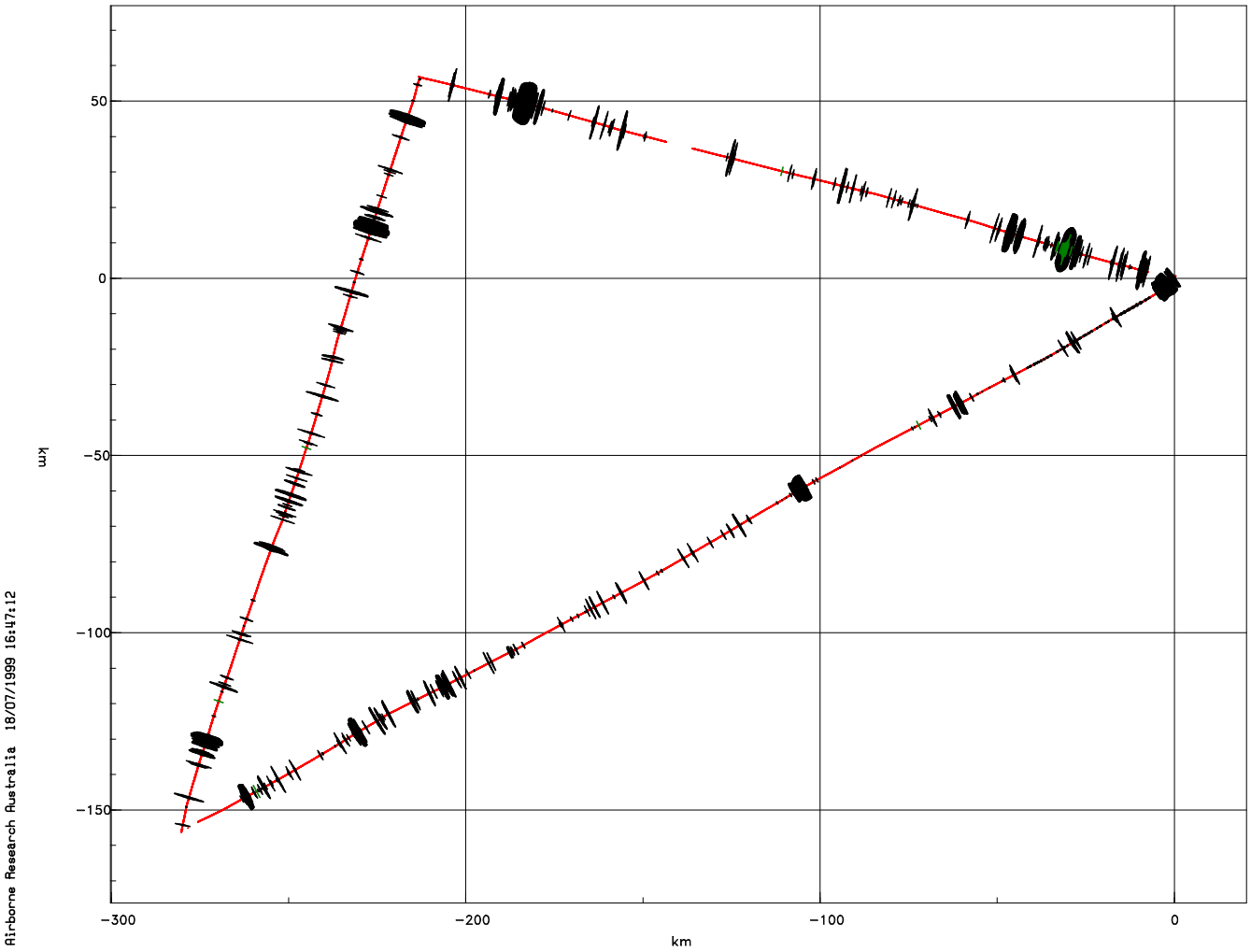
NAURU99 24Jun99 24T2 01:10–04:17UTC
Cloud (black) and rain (green) indicator



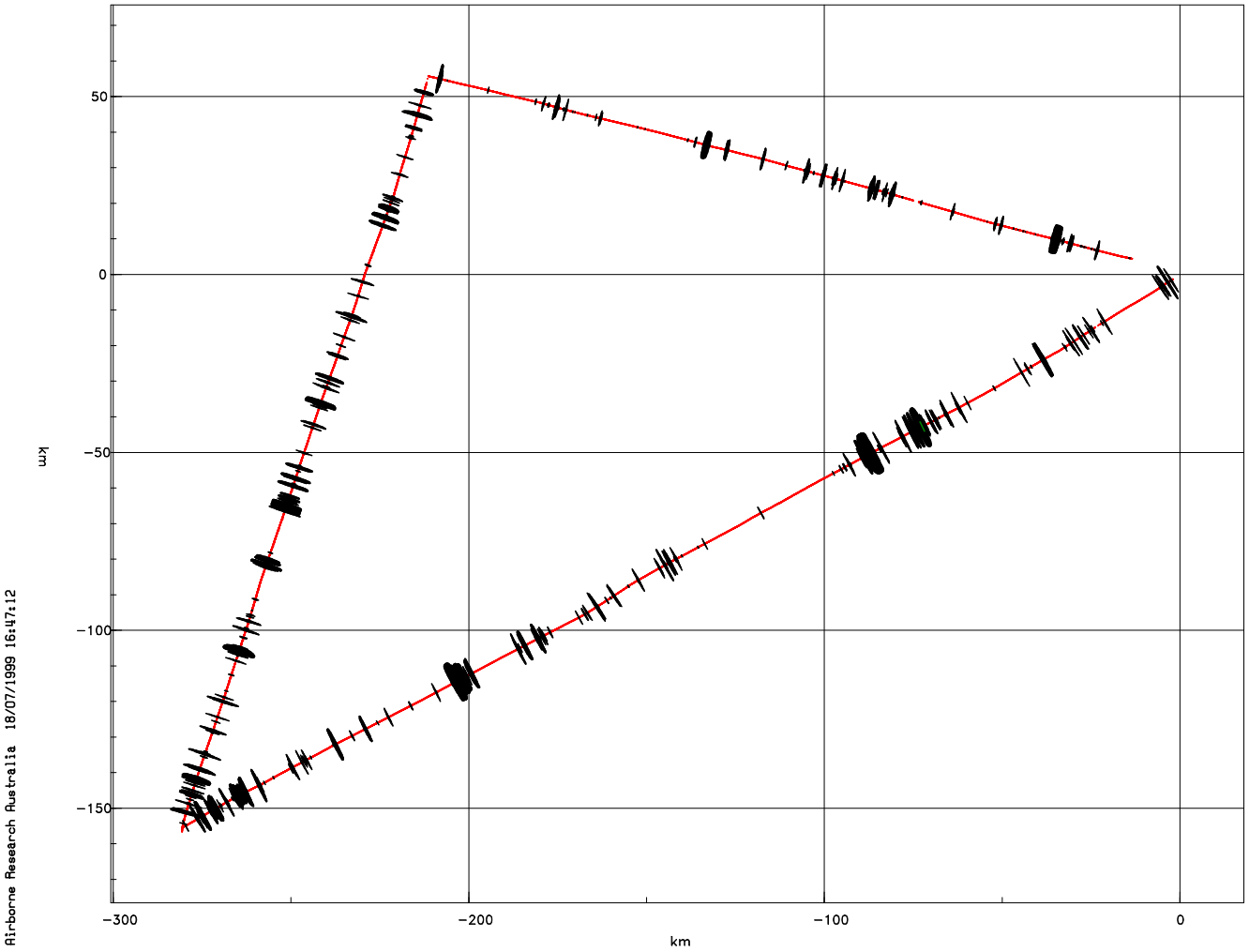
NAURU99 25Jun99 25T1 21:44–00:56UTC
Cloud (black) and rain (green) indicator



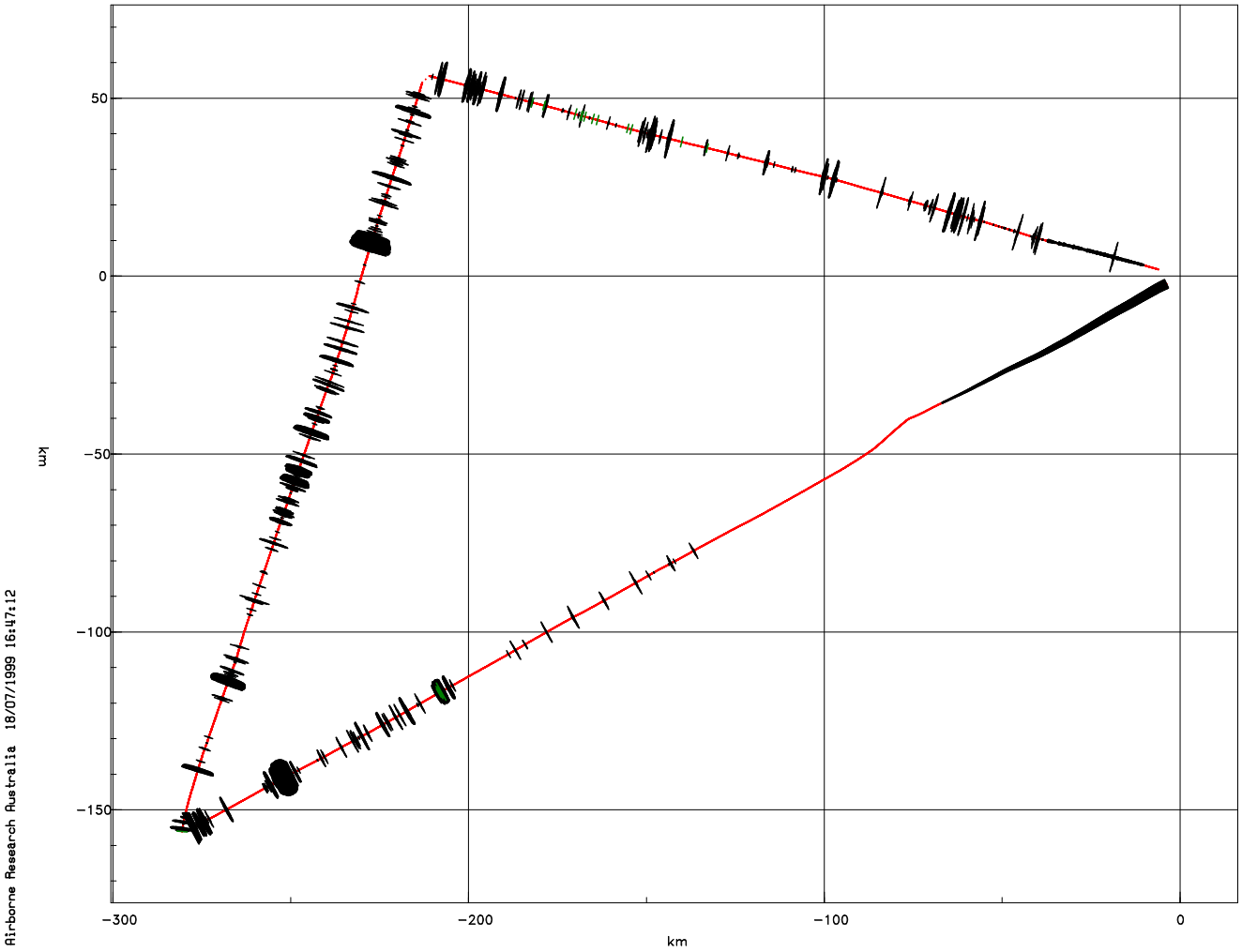
NAURU99 25Jun99 25T2 01:35–04:43UTC
Cloud (black) and rain (green) indicator



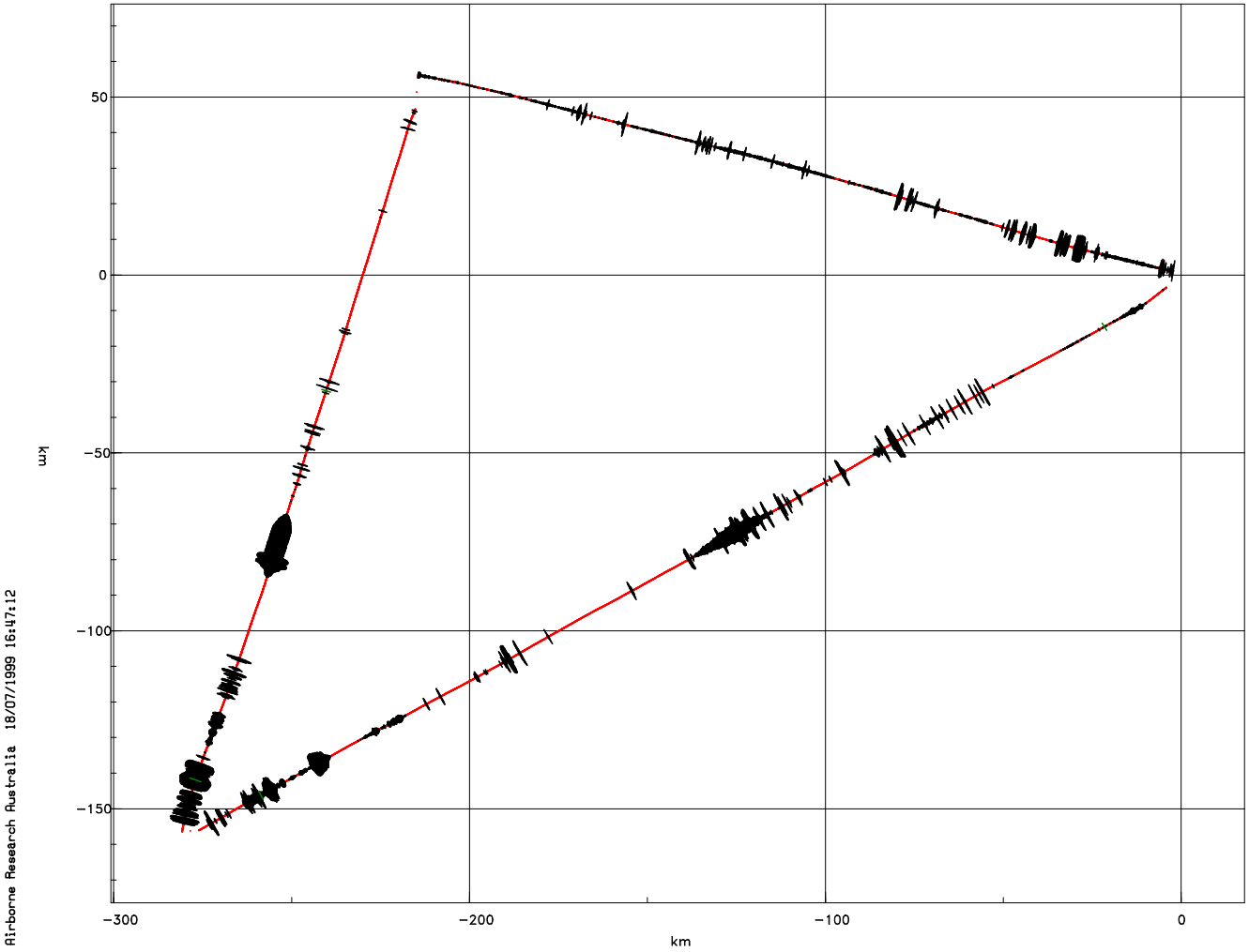
NAURU99 27Jun99 27T1 21:31–00:41UTC
Cloud (black) and rain (green) indicator



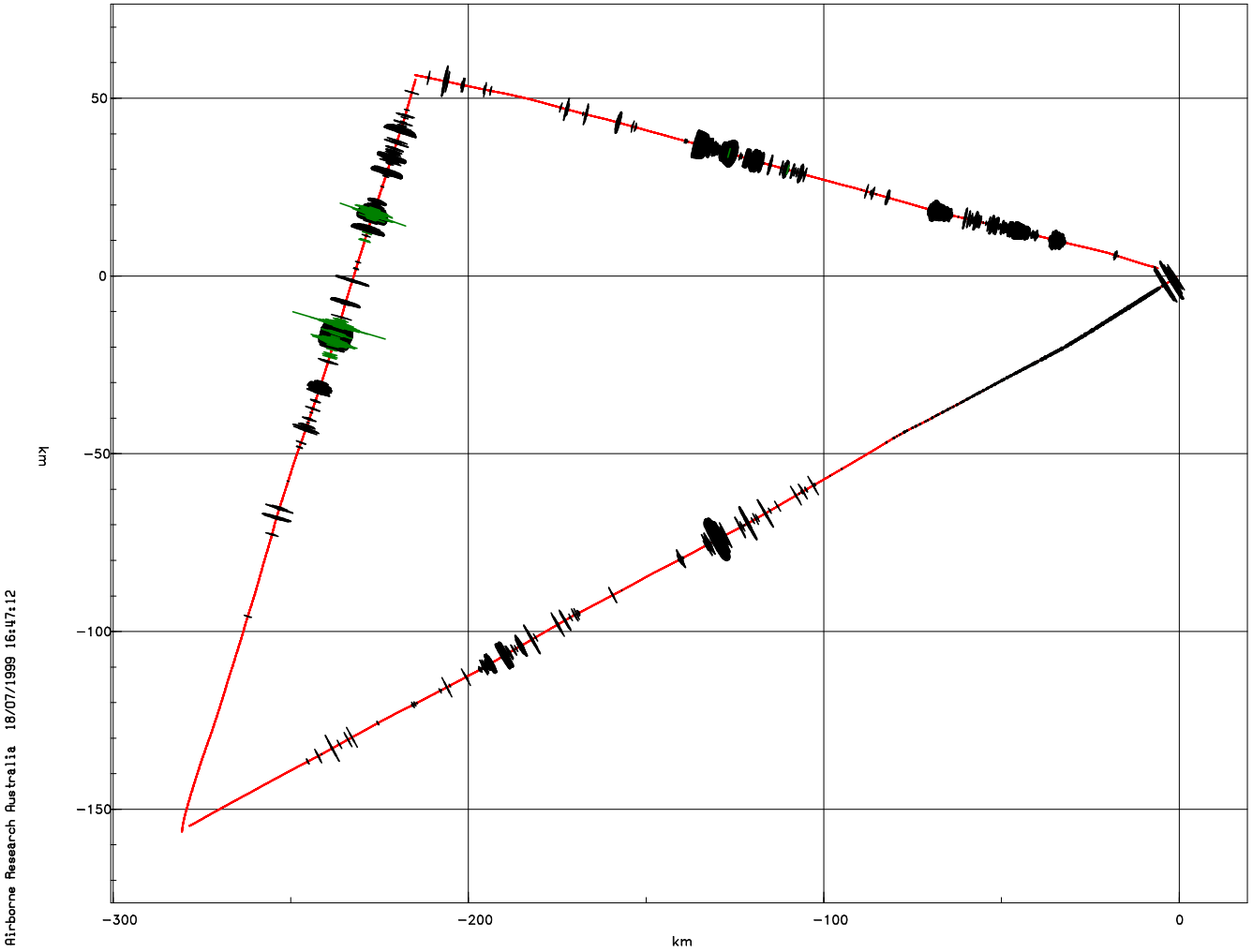
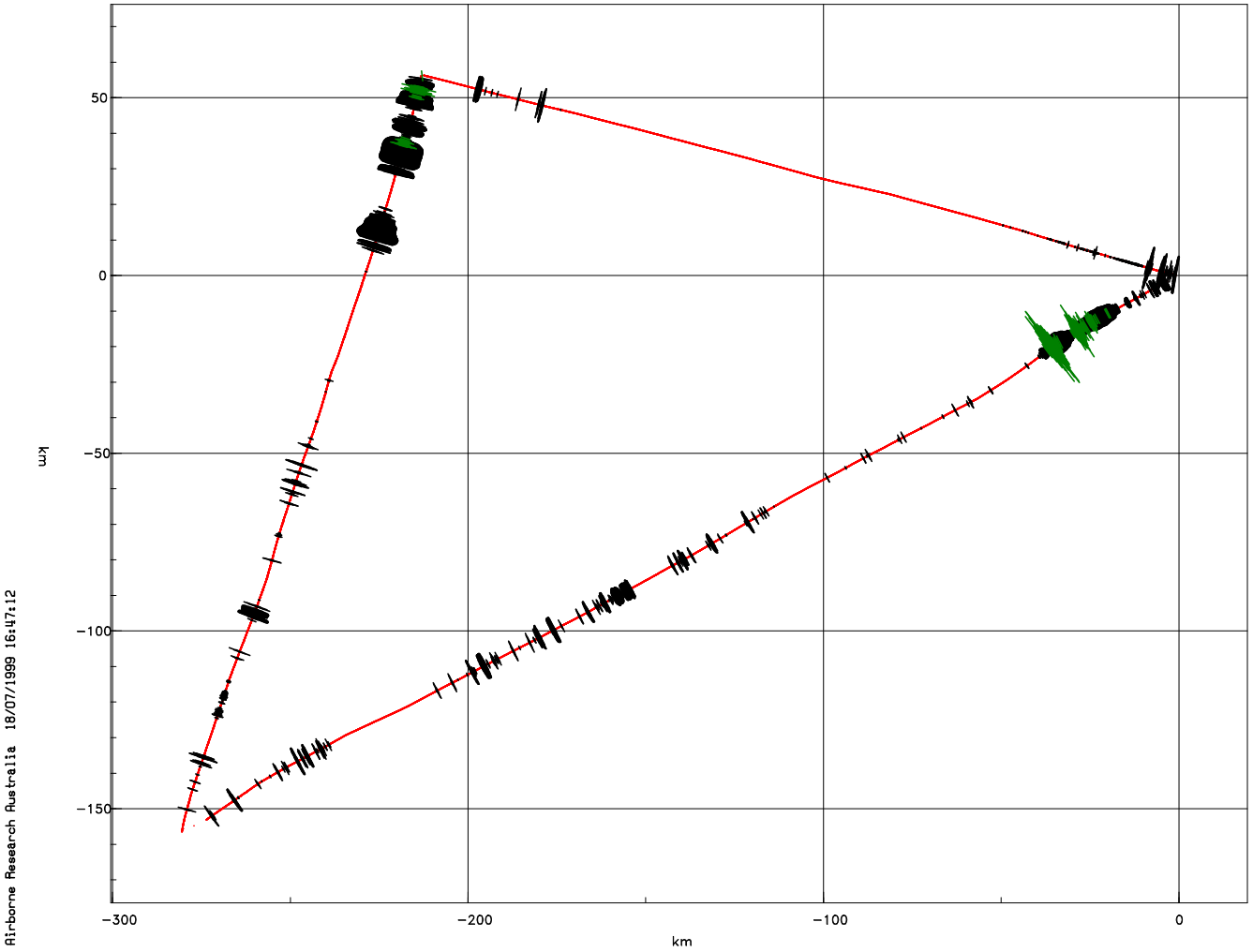
NAURU99 27Jun99 27T2 00:47–04:36UTC
Cloud (black) and rain (green) indicator



NAURU99 28Jun99 28T1 21:36–02:06UTC
Cloud (black) and rain (green) indicator



NAURU99 30Jun99 30T1 21:56–01:03UTC
Cloud (black) and rain (green) indicator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