Plots of Arrival Reroute Maneuver Candidates for Conflict Resolution

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The following plots show arrival reroute maneuver candidates for conflict resolution. In these plots, all maneuvers are computed and assigned shortly before entry into the TRACON airspace. The original route for each flight is shown as a dashed blue line, and the reroute candidates are shown as solid gray lines. The red dashed rectangle around DFW airport is a restricted zone (that was defined for this study) to keep DAL flights from getting too close to DFW.

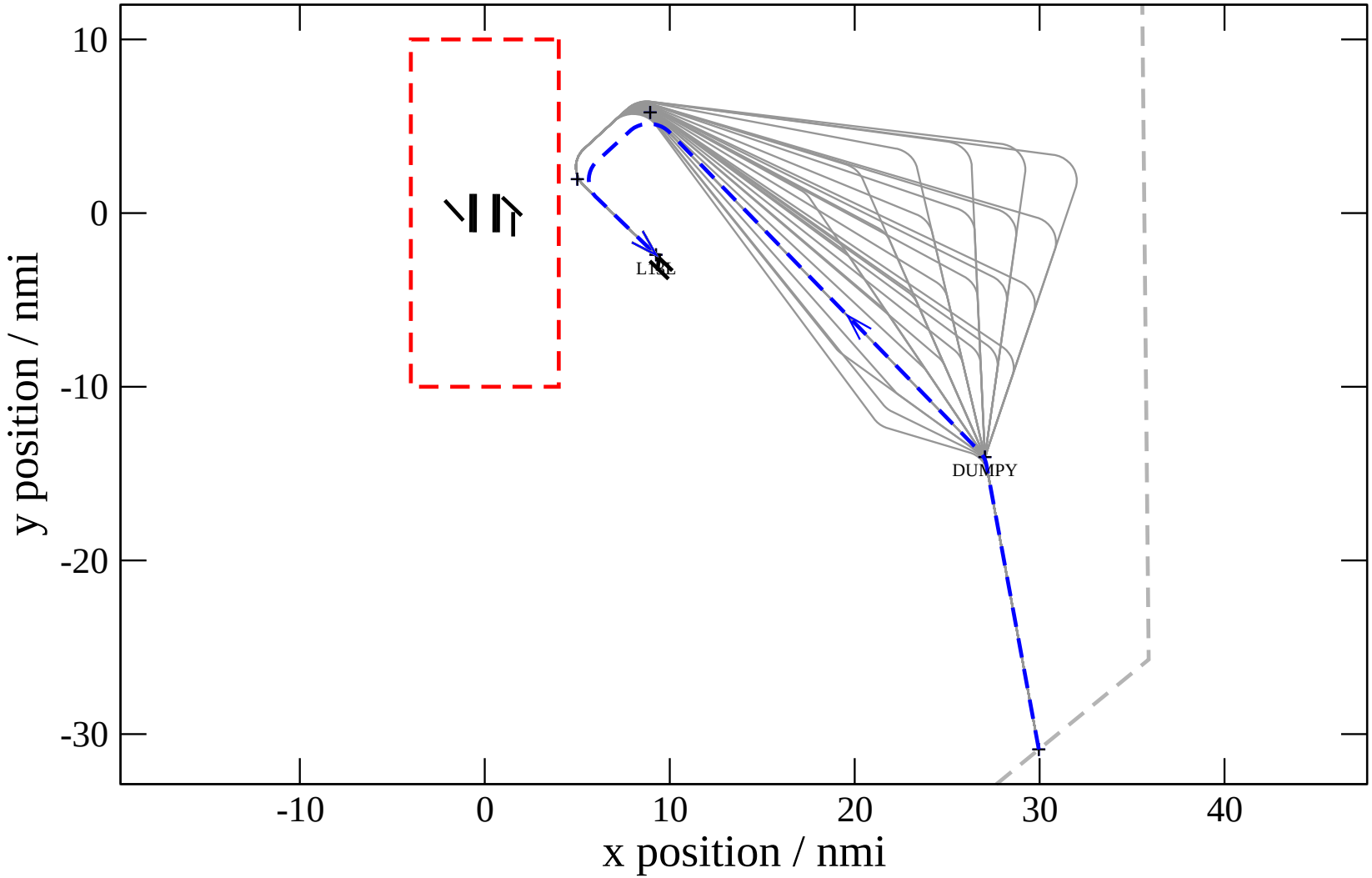
The candidate routes are generated by permuting each of three parameters through a set of values. The three parameters are: (1) the initial turn angle, (2) the length of the leg following the turn, and (3) the length of the final approach leg. Routes that have turn angles greater than a specified threshold are rejected, as are routes that exit the TRACON boundary, or DAL arrivals that enter the restricted space around DFW airport. The resulting number of candidate routes is shown in the subtitle. The resulting delay is computed for each candidate, and the one with the least estimated delay is selected from those that resolve the conflict, if any do.

The altitude and along-track distance plots that follow the route plots were used to help verify correctness of the rerouting algorithm. The original altitudes and along-track profiles are shown in a wide black line, and the values for the rerouted trajectories are shown in red. The fact that they are the same shows that the longitudinal profiles of the rerouted trajectories are identical to the original for its entire length, as they should be.

[generated with plot/RerouteArrPlots.scala]

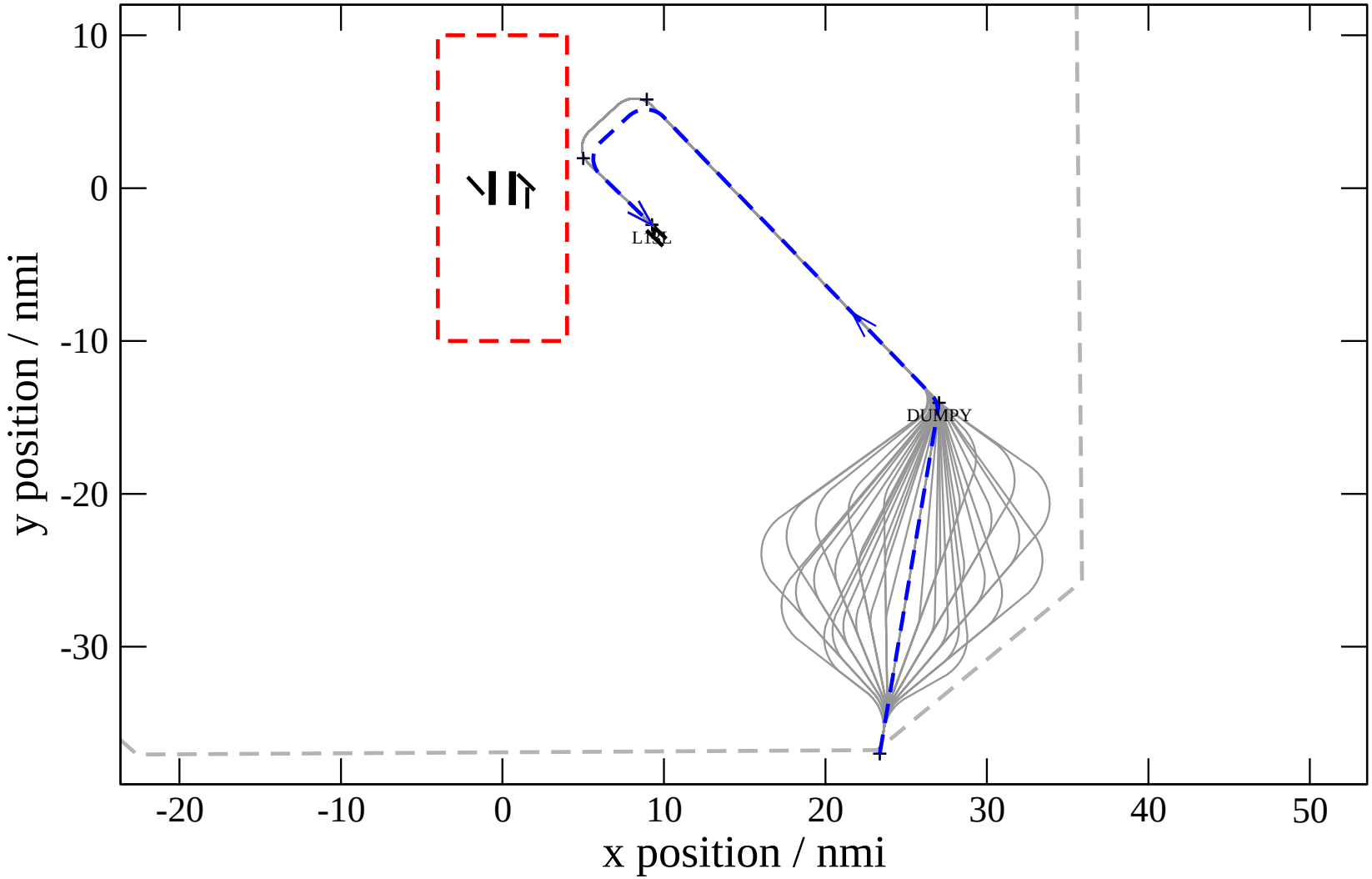
Departure Reroute Candidates

110 (B737 D DAL/13L Arr) 32 candidates



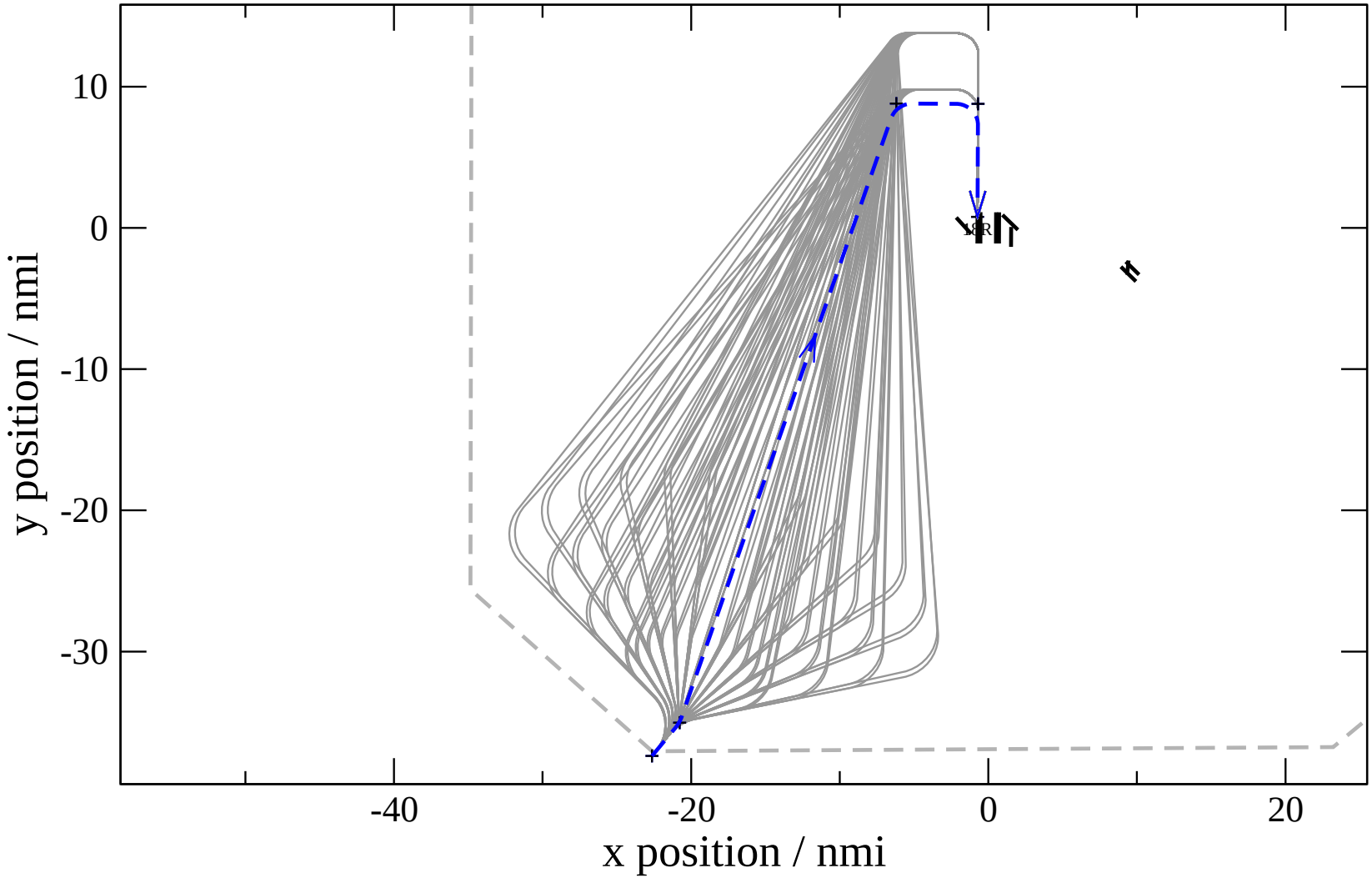
Departure Reroute Candidates

1322 (BE20 F DAL/13L Arr) 37 candidates



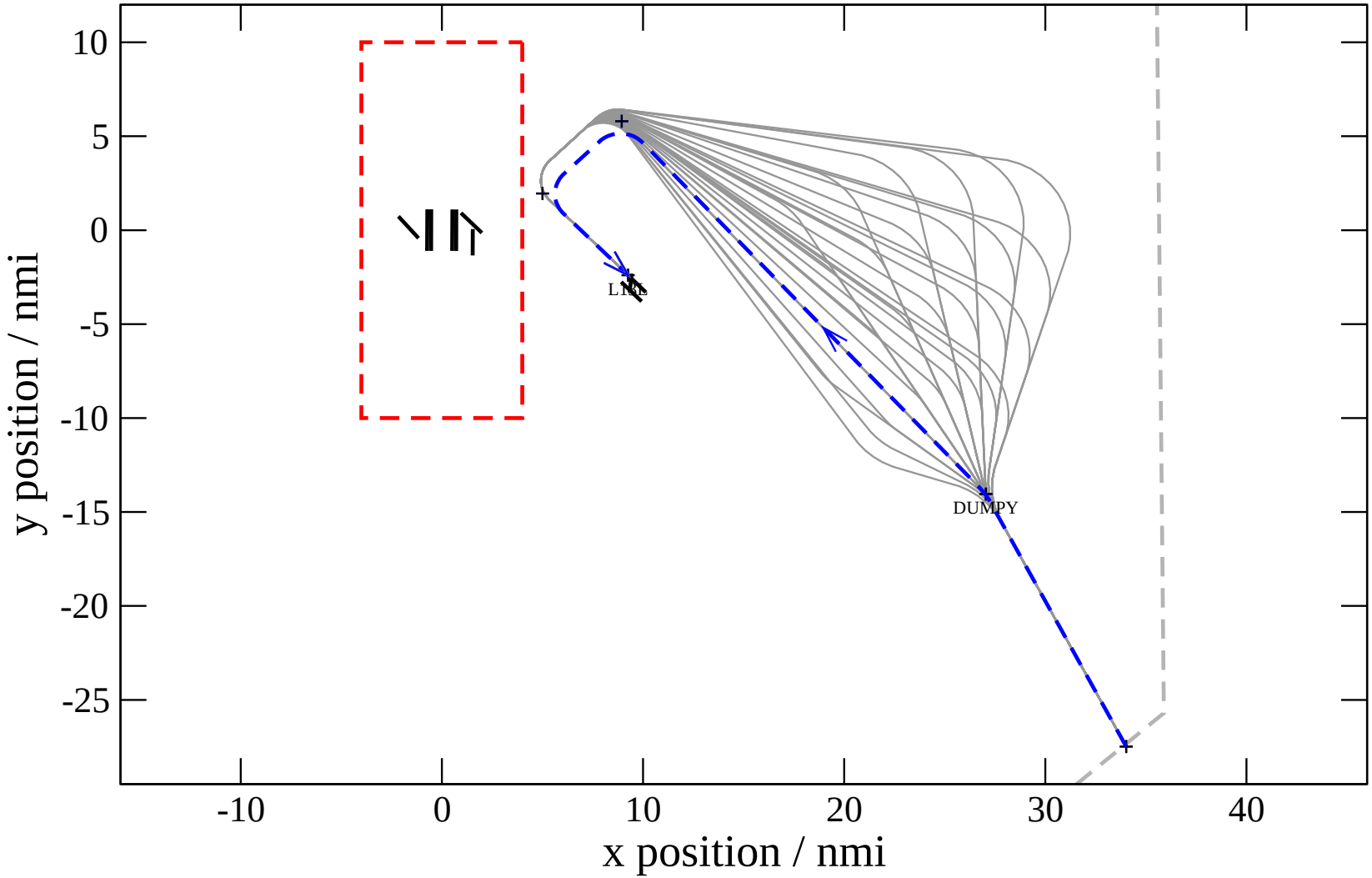
Departure Reroute Candidates

1334 (E145 E DFW/18R Arr) 104 candidates



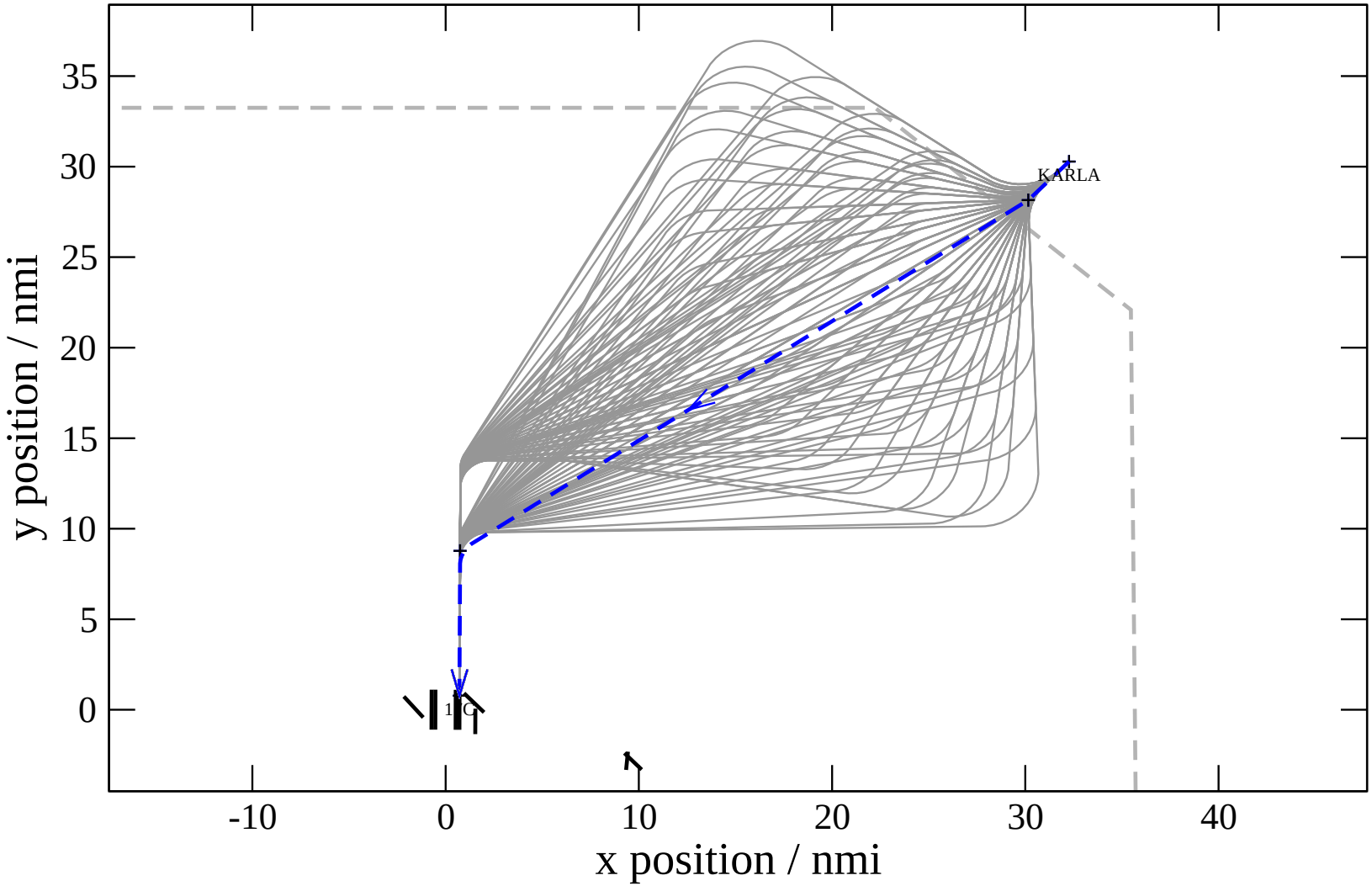
Departure Reroute Candidates

1419 (CRJ2 E DAL/13L Arr) 32 candidates



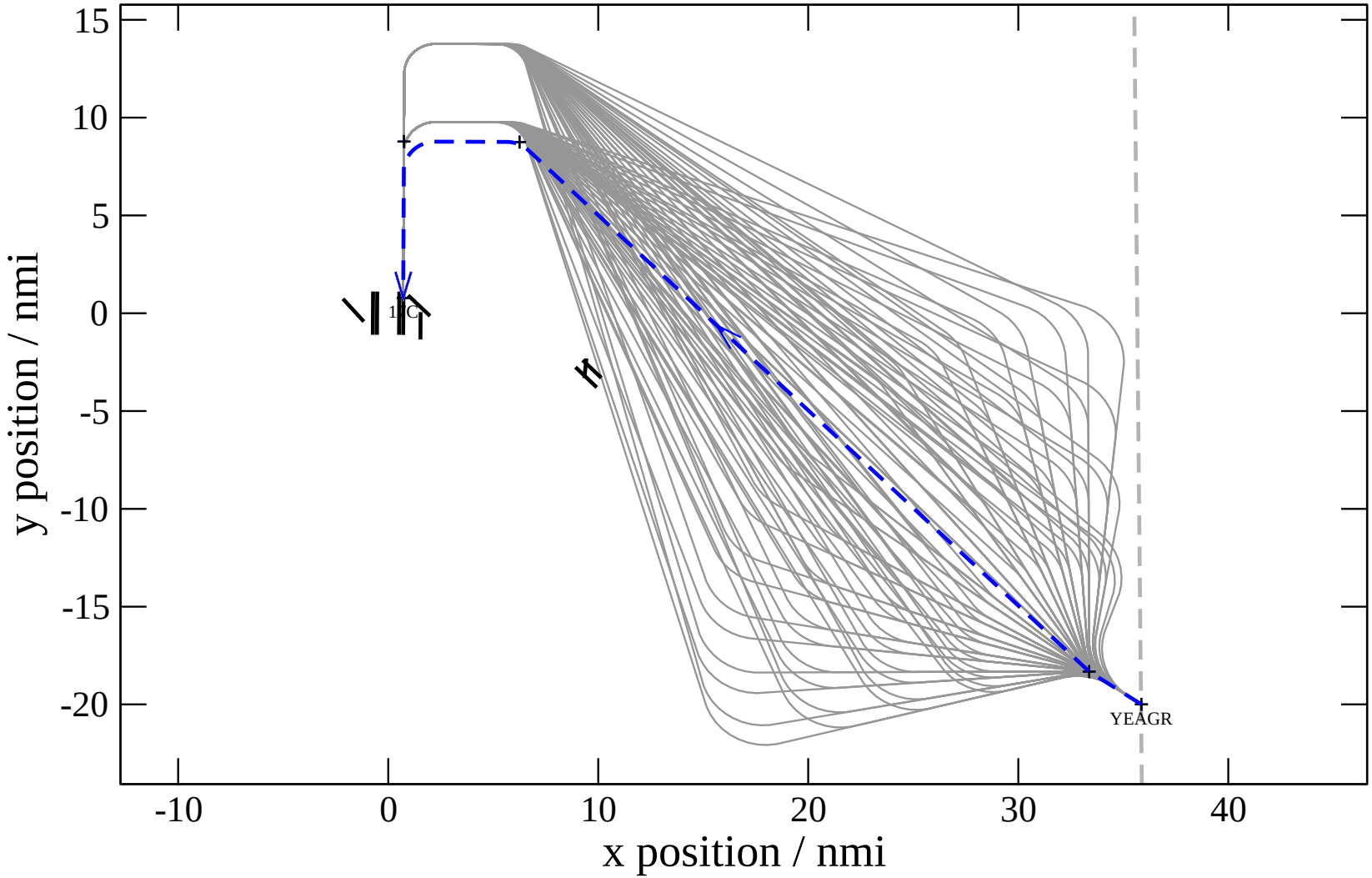
Departure Reroute Candidates

1439 (DC10 C DFW/17C Arr) 104 candidates



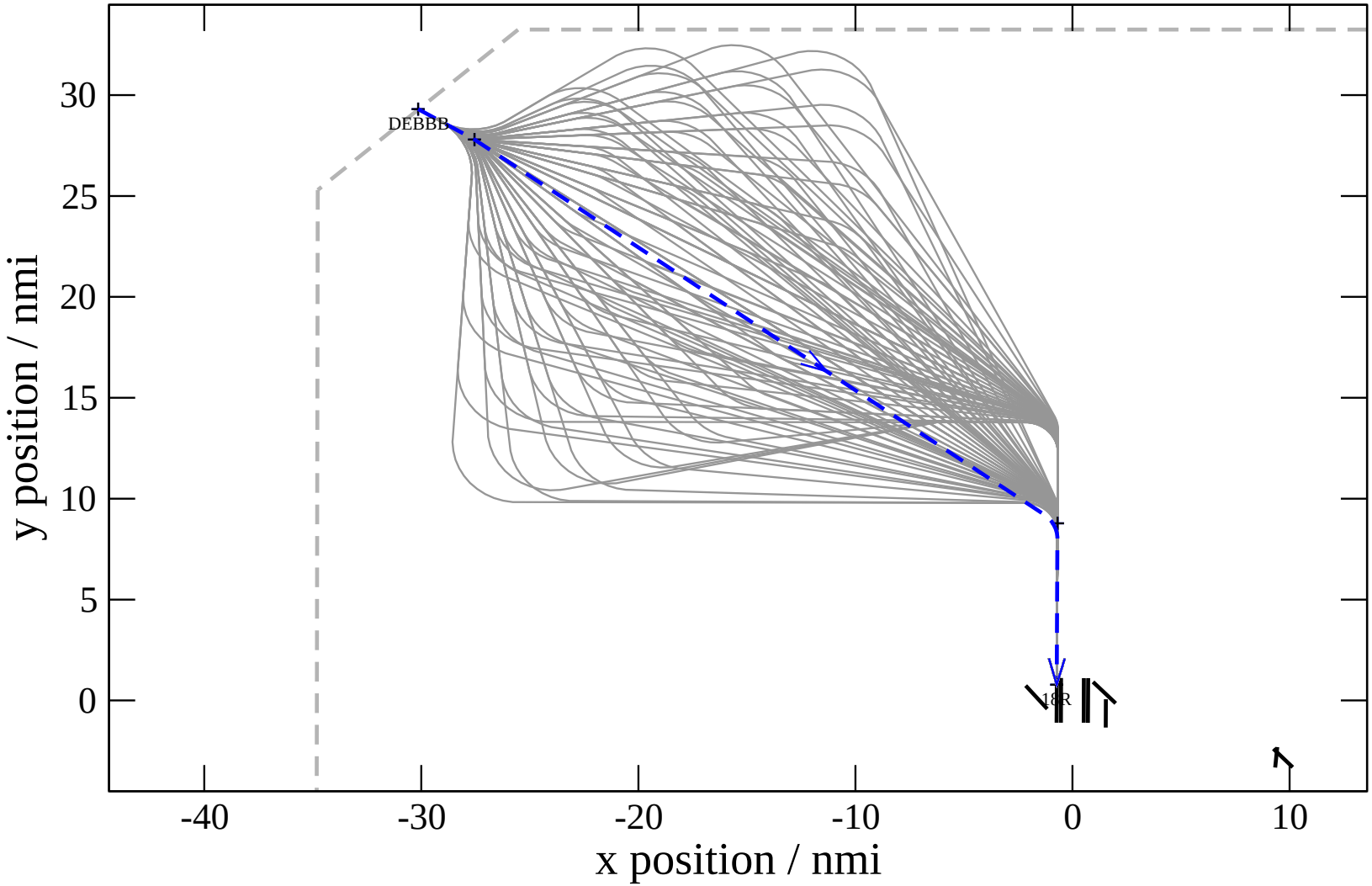
Departure Reroute Candidates

1448 (LJ45 F DFW/17C Arr) 96 candidates



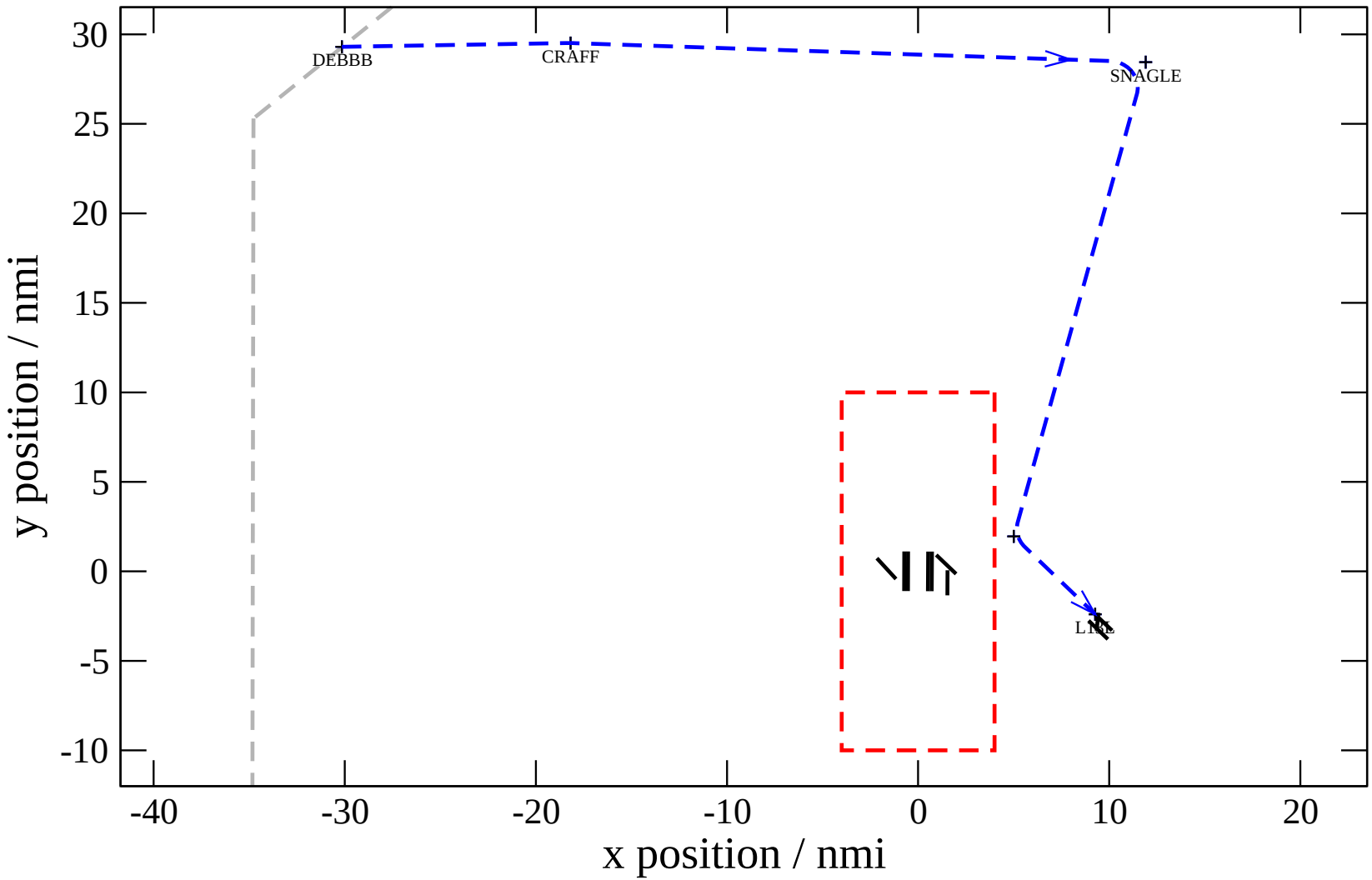
Departure Reroute Candidates

1512 (BE20 F DFW/18R Arr) 99 candidates



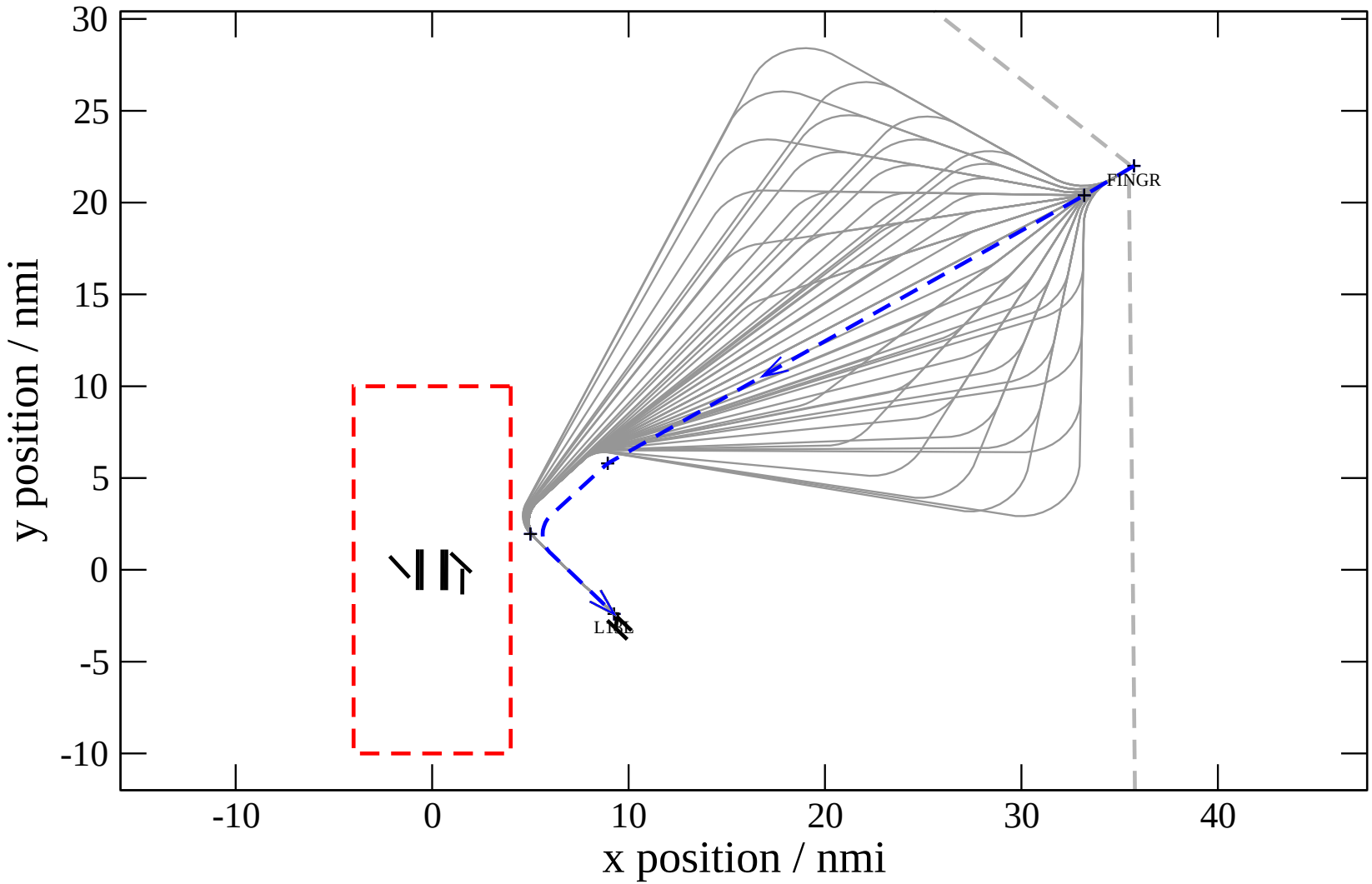
Departure Reroute Candidates

1514 (B737 D DAL/13L Arr) 0 candidates



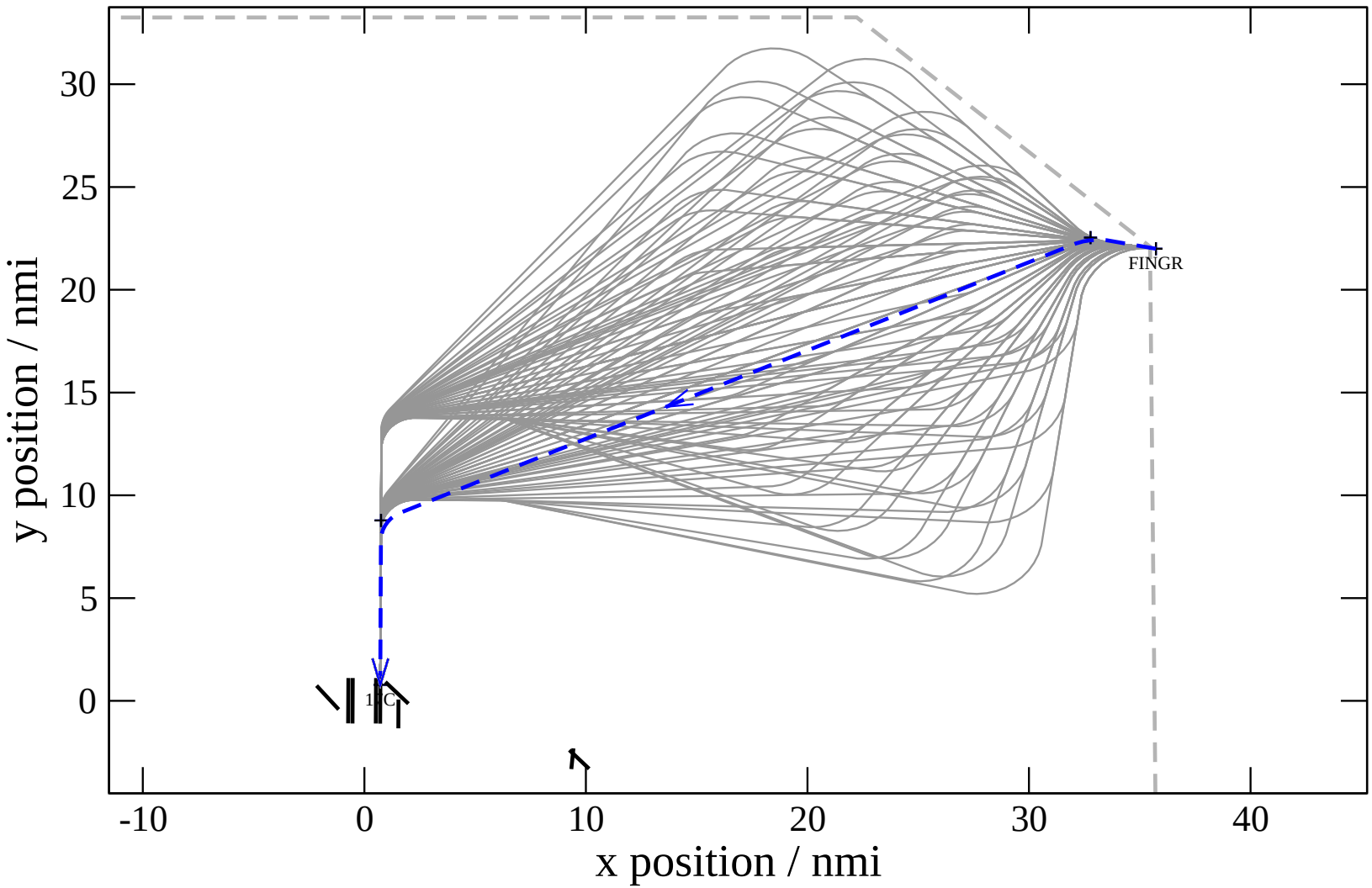
Departure Reroute Candidates

1558 (B733 D DAL/13L Arr) 52 candidates



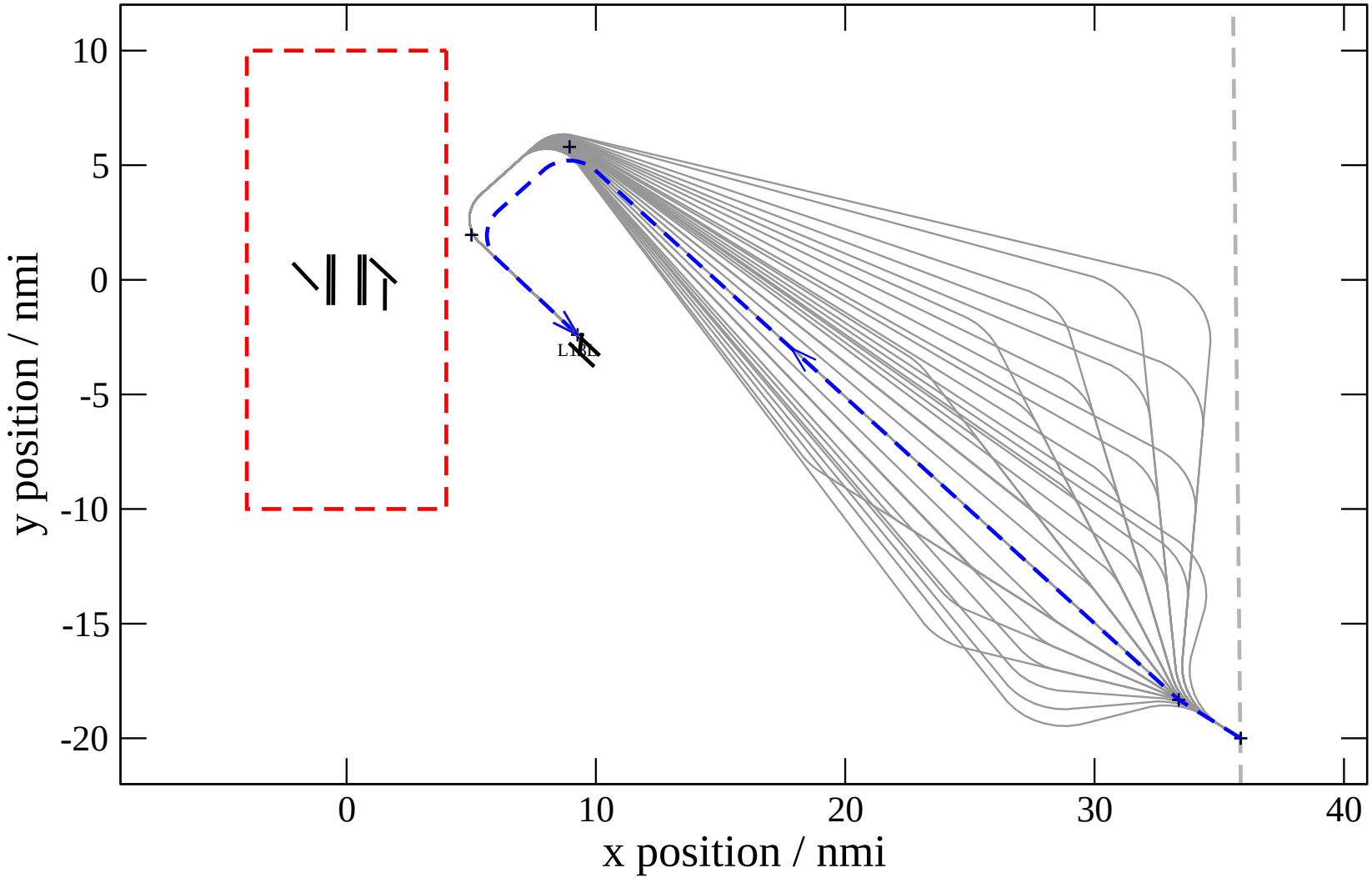
Departure Reroute Candidates

1620 (DC10 C DFW/17C Arr) 102 candidates



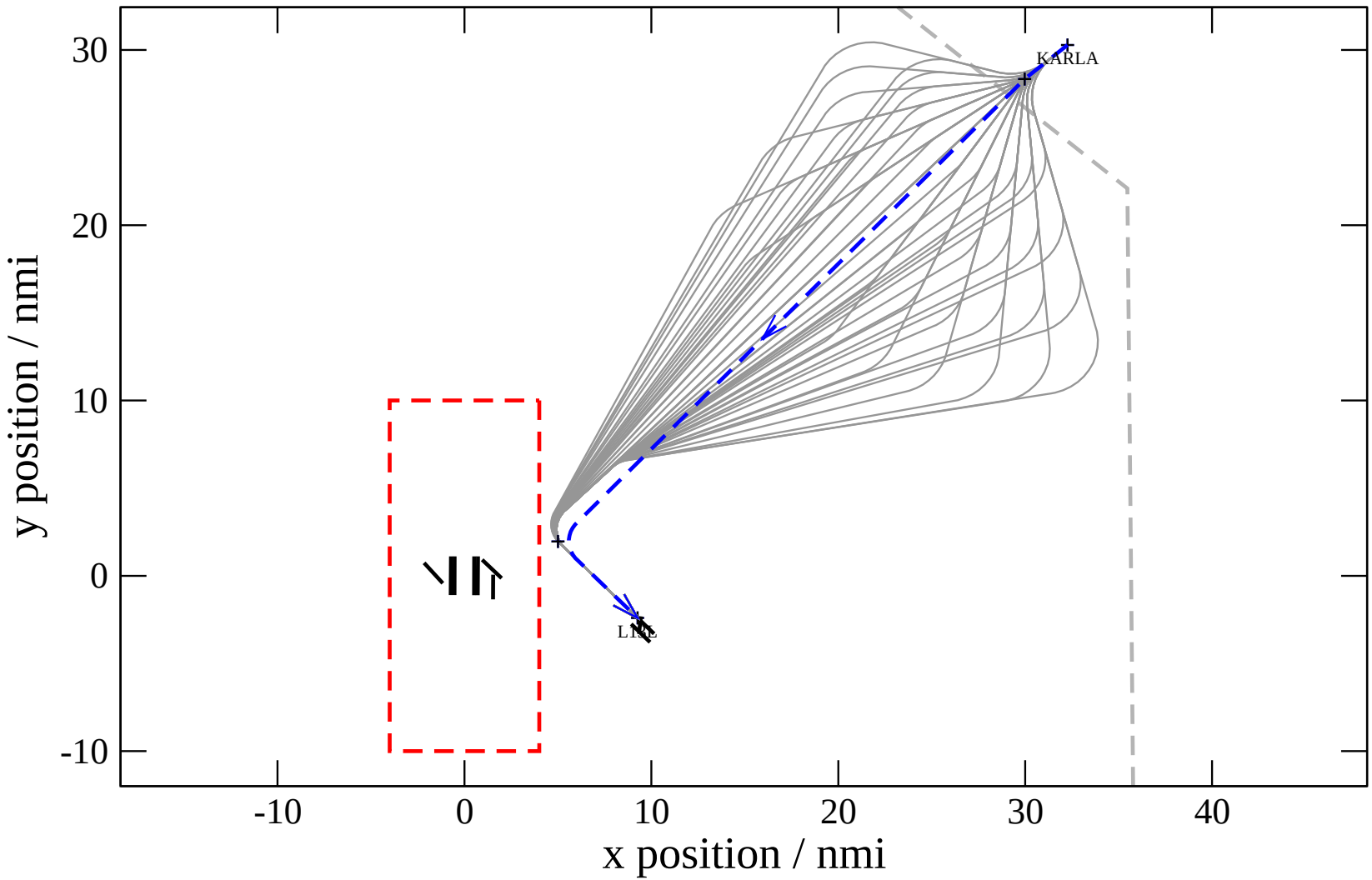
Departure Reroute Candidates

1688 (B737 D DAL/13L Arr) 36 candidates



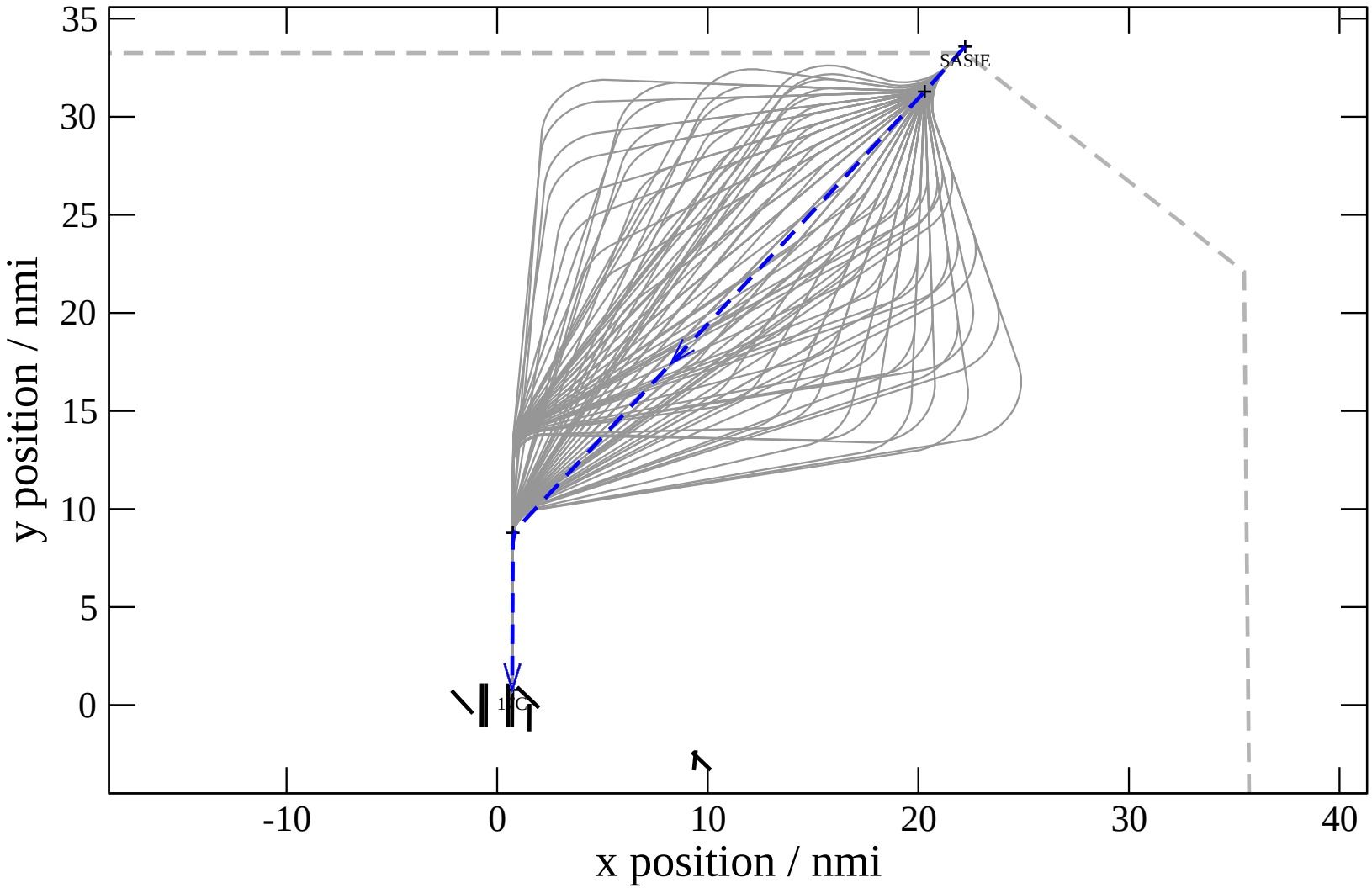
Departure Reroute Candidates

1704 (B737 D DAL/13L Arr) 45 candidates



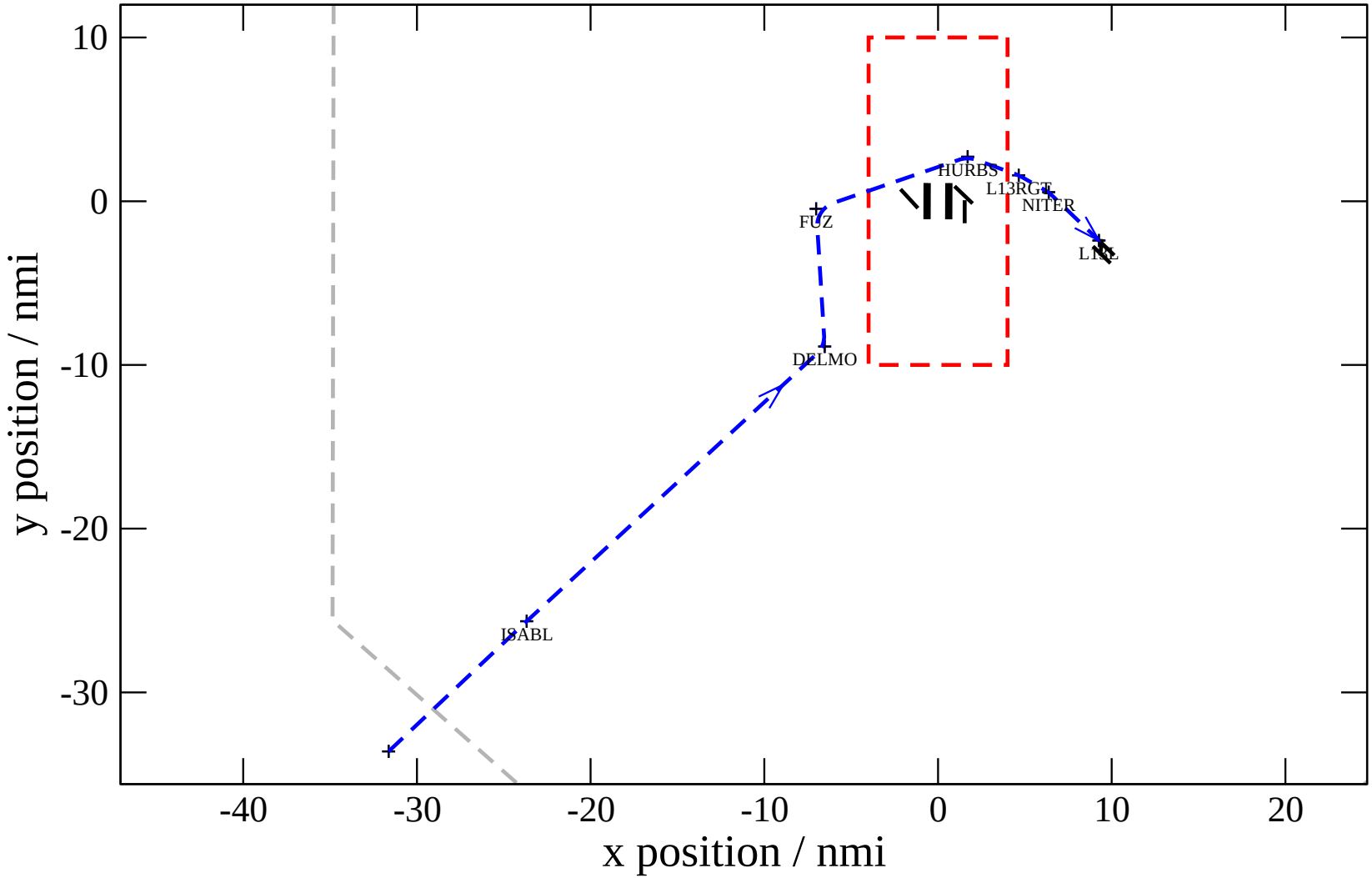
Departure Reroute Candidates

1809 (A306 C DFW/17C Arr) 95 candidates



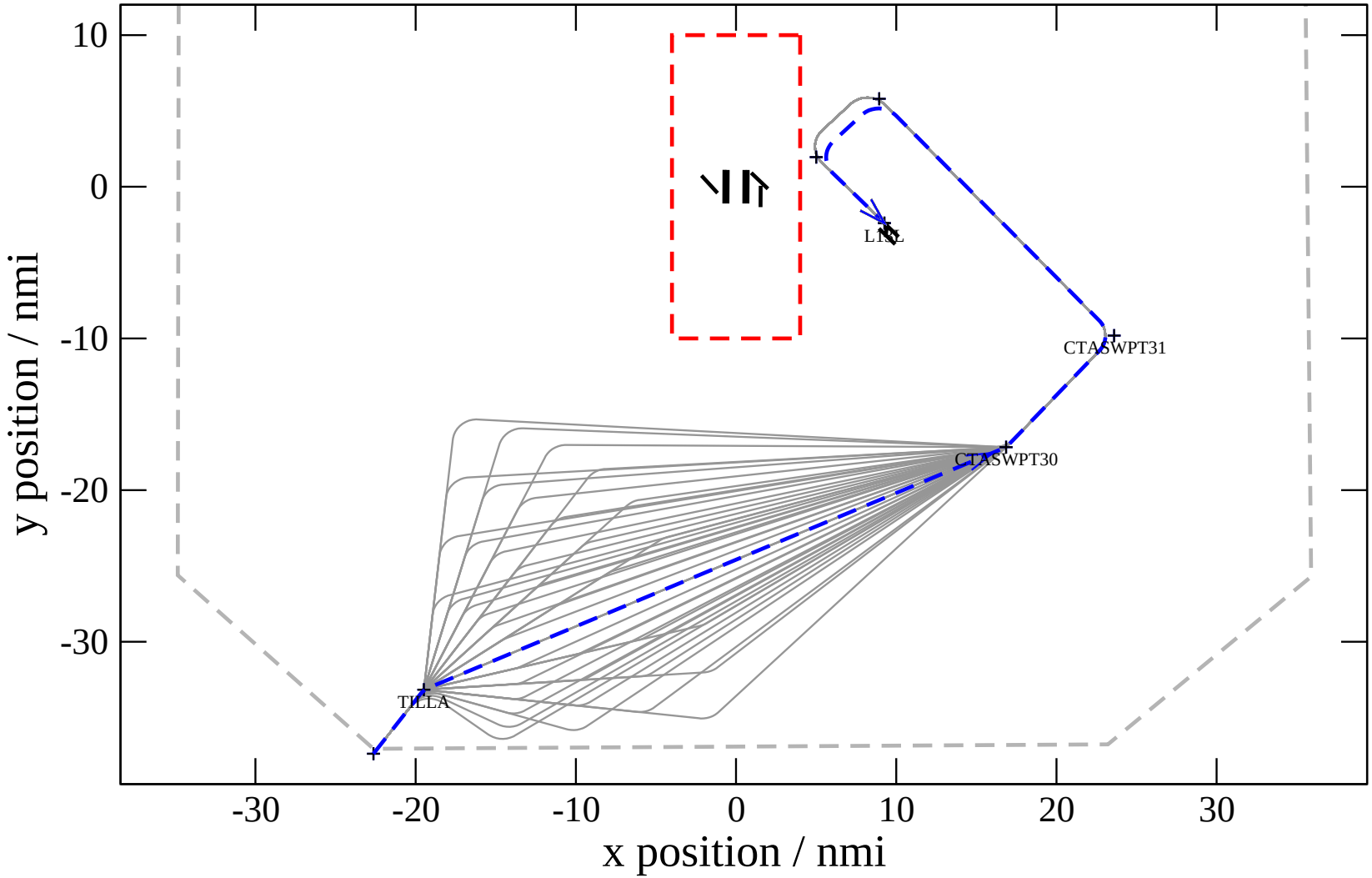
Departure Reroute Candidates

1841 (B733 D DAL/13L Arr) 0 candidates



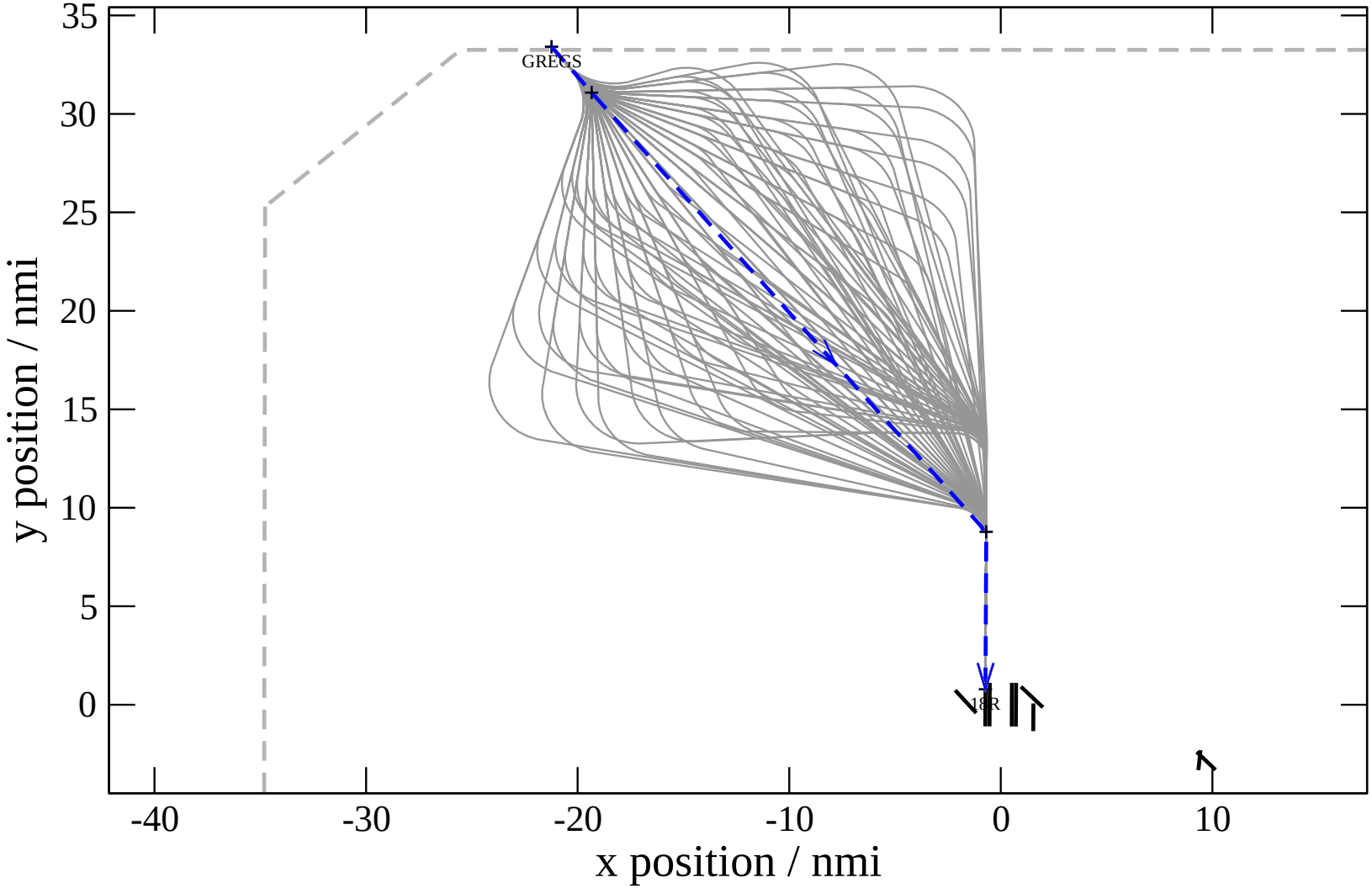
Departure Reroute Candidates

1842 (B733 D DAL/13L Arr) 44 candidates



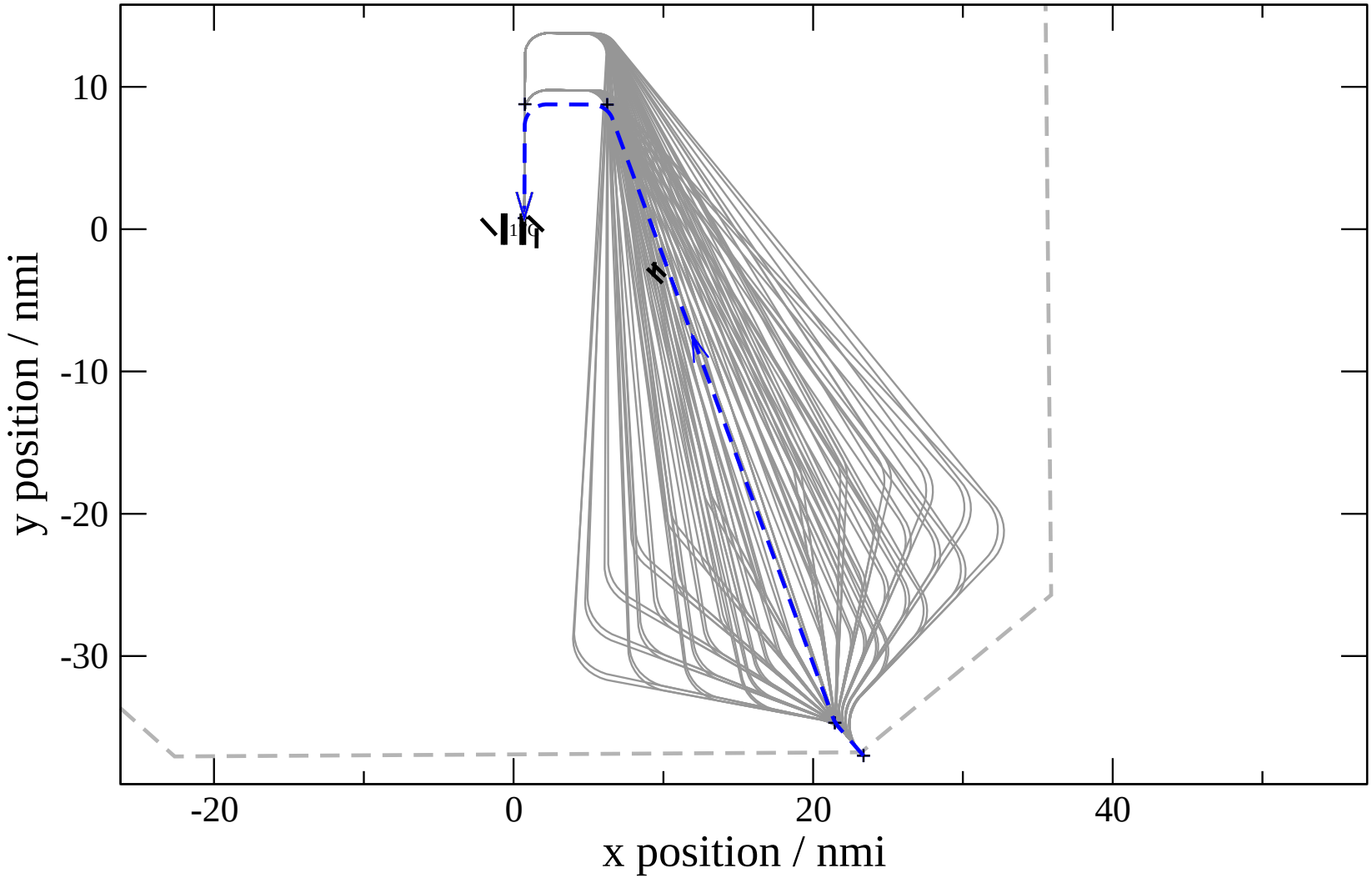
Departure Reroute Candidates

1911 (E145 E DFW/18R Arr) 97 candidates



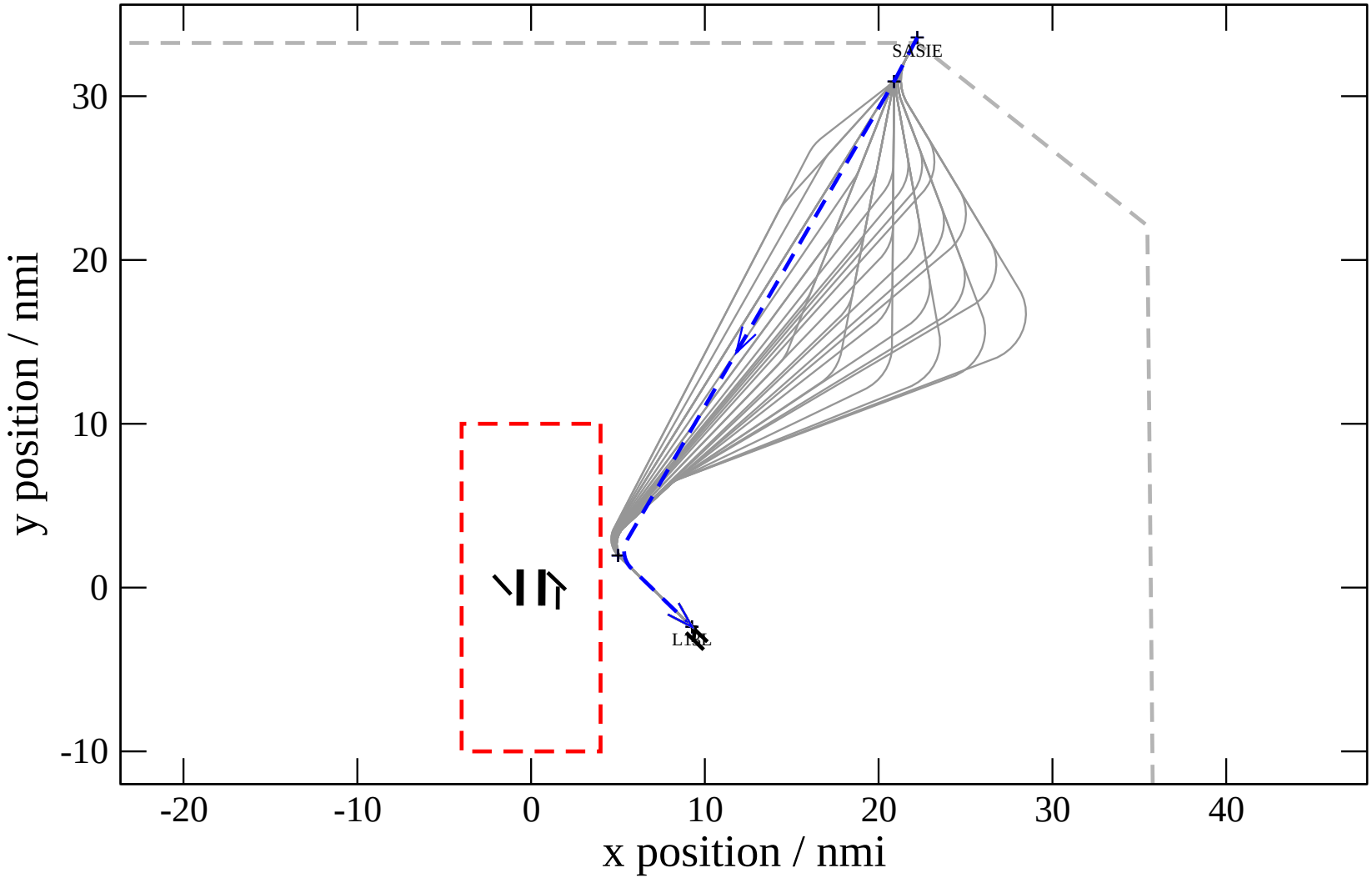
Departure Reroute Candidates

1922 (E135 E DFW/17C Arr) 104 candidates



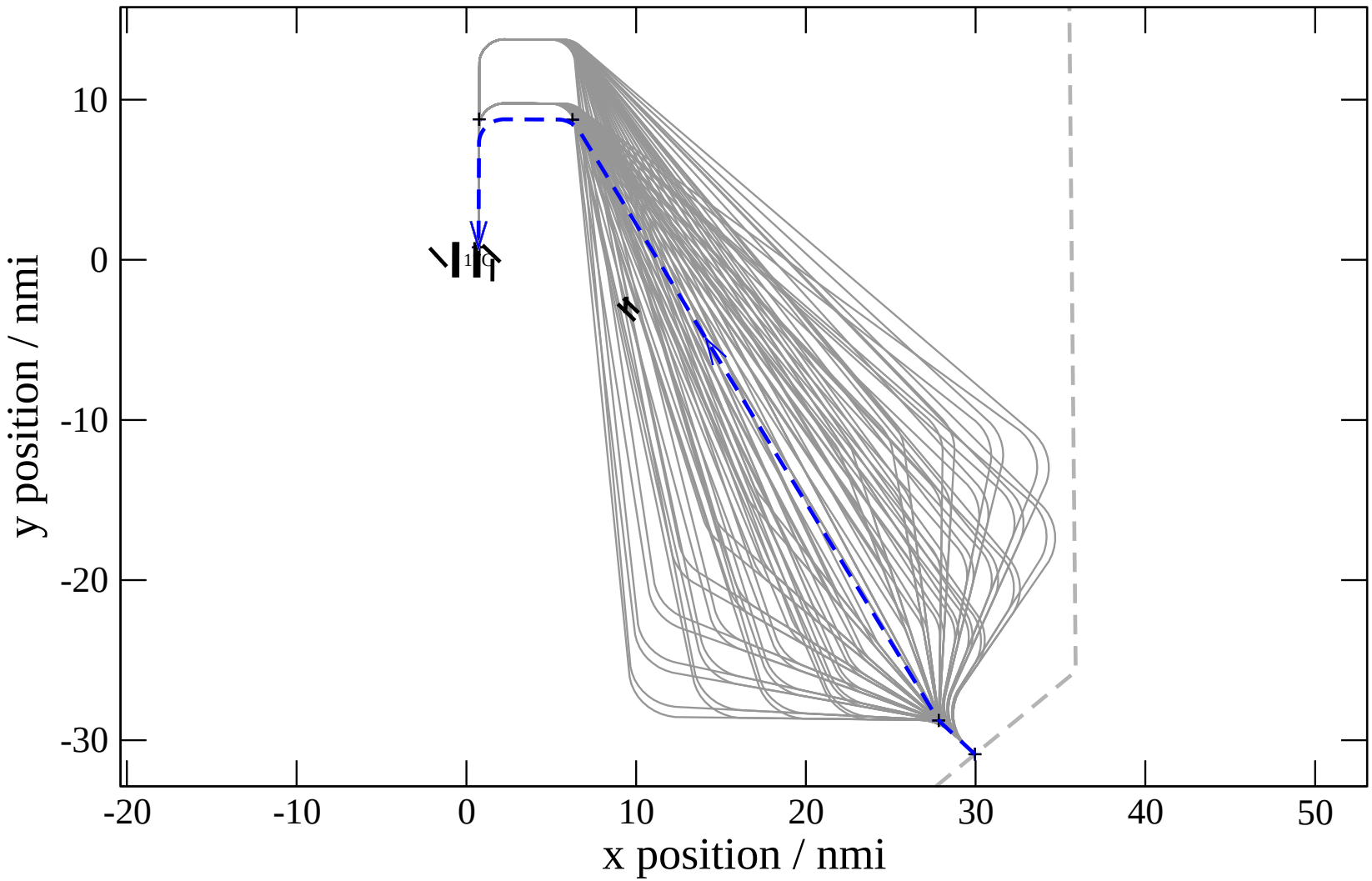
Departure Reroute Candidates

2002 (B737 D DAL/13L Arr) 31 candidates



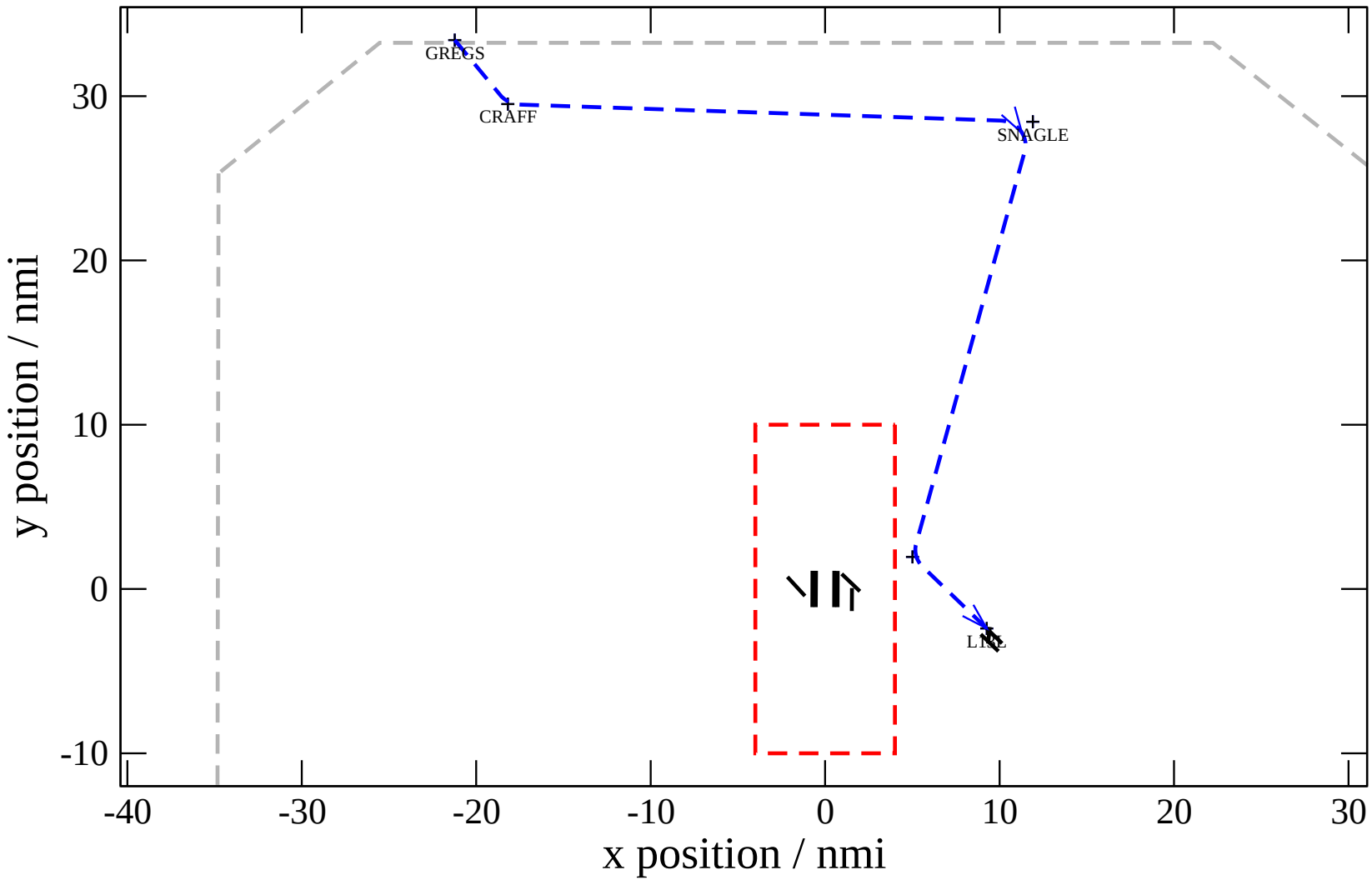
Departure Reroute Candidates

2118 (B763 C DFW/17C Arr) 102 candidates



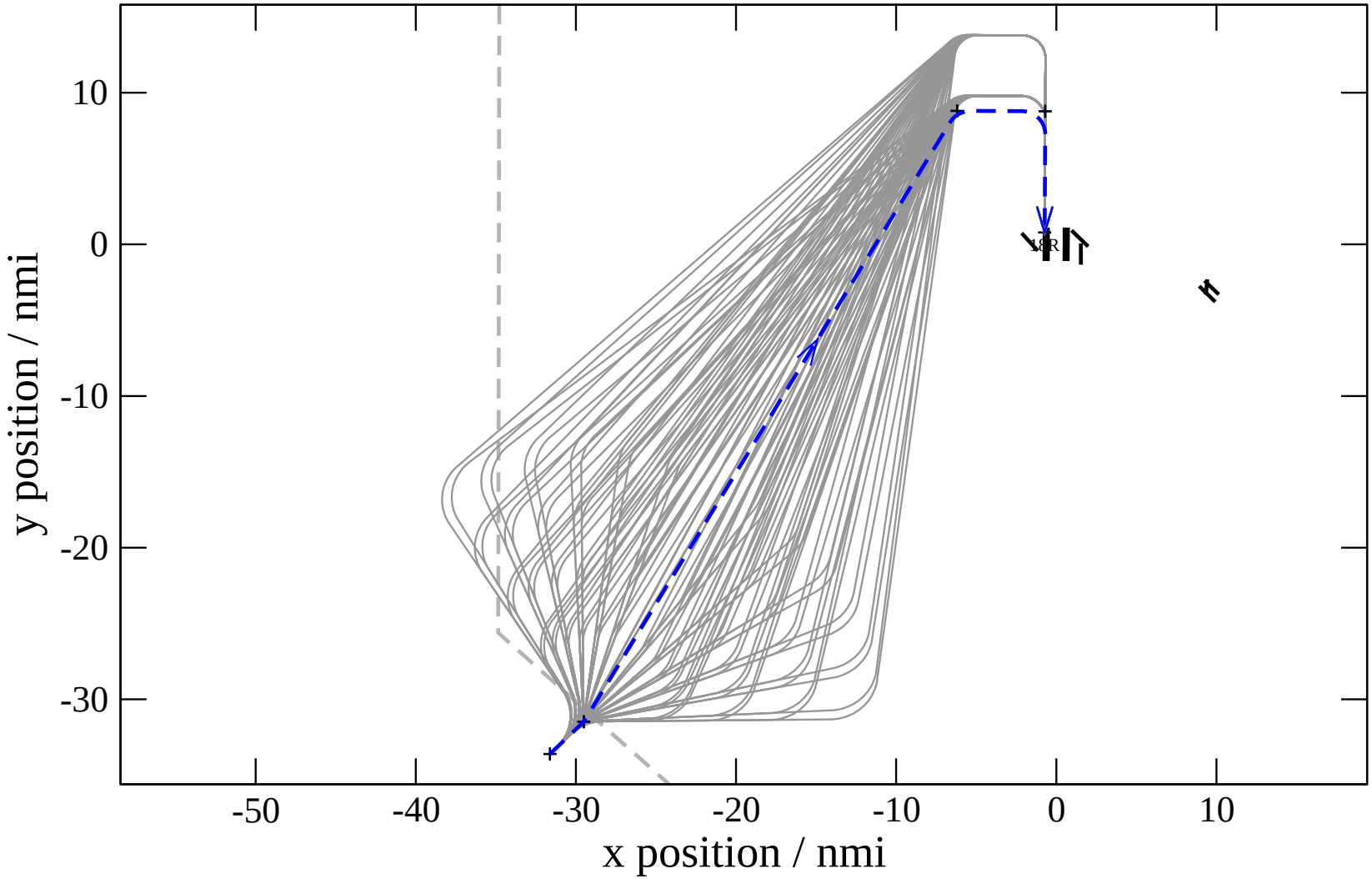
Departure Reroute Candidates

23 (C441 F DAL/13L Arr) 0 candidates



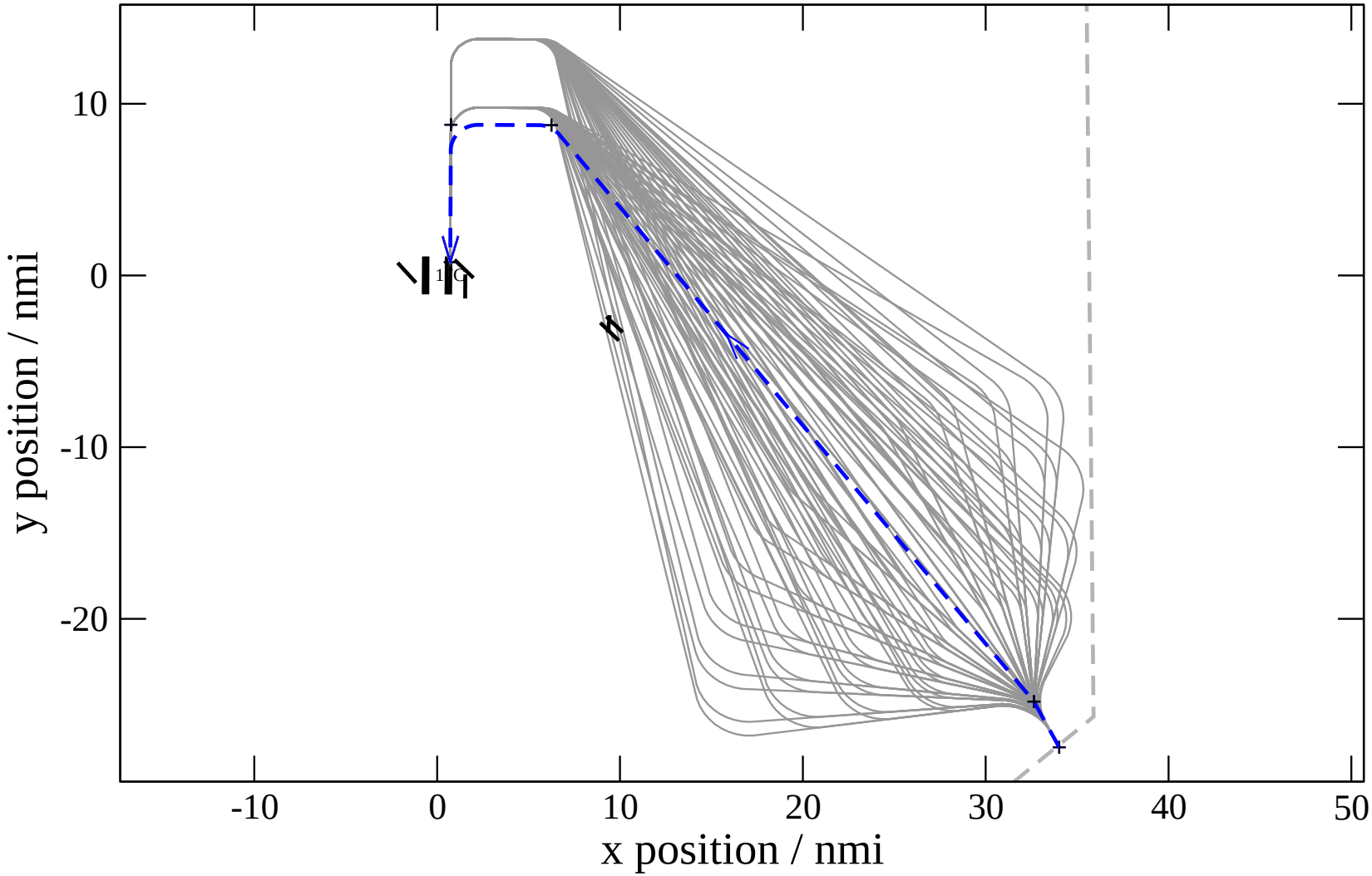
Departure Reroute Candidates

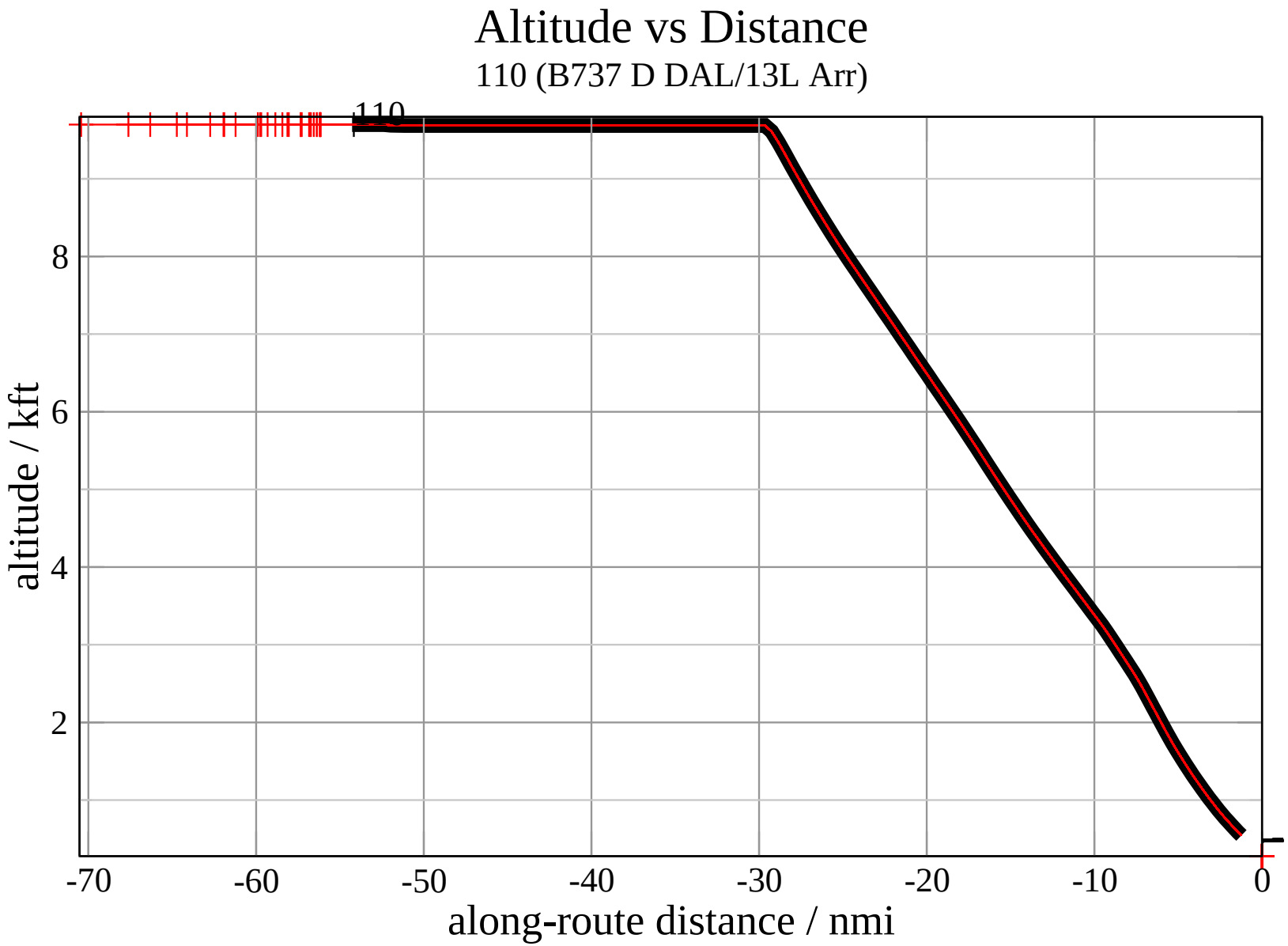
25 (E135 E DFW/18R Arr) 104 candidates

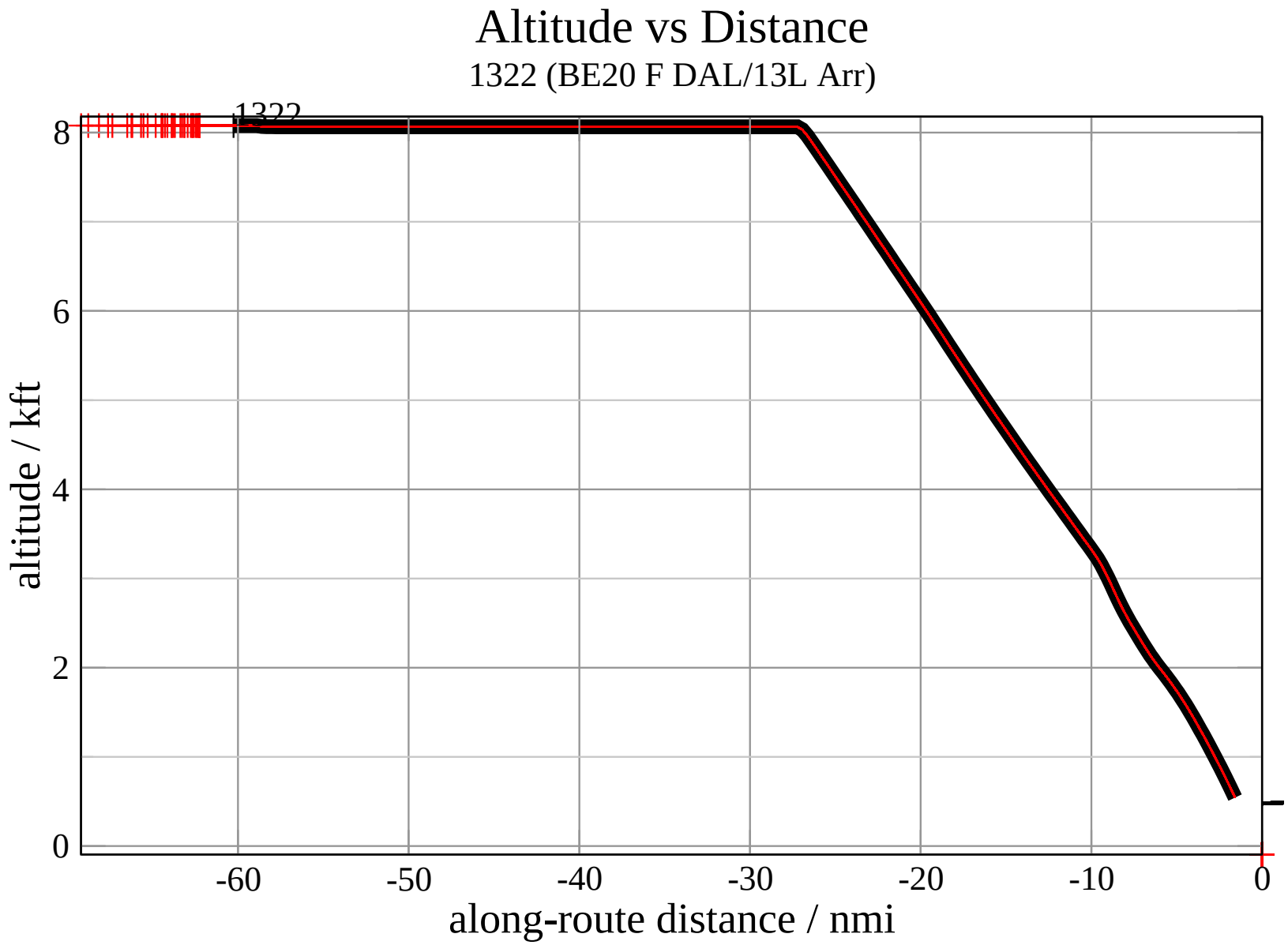


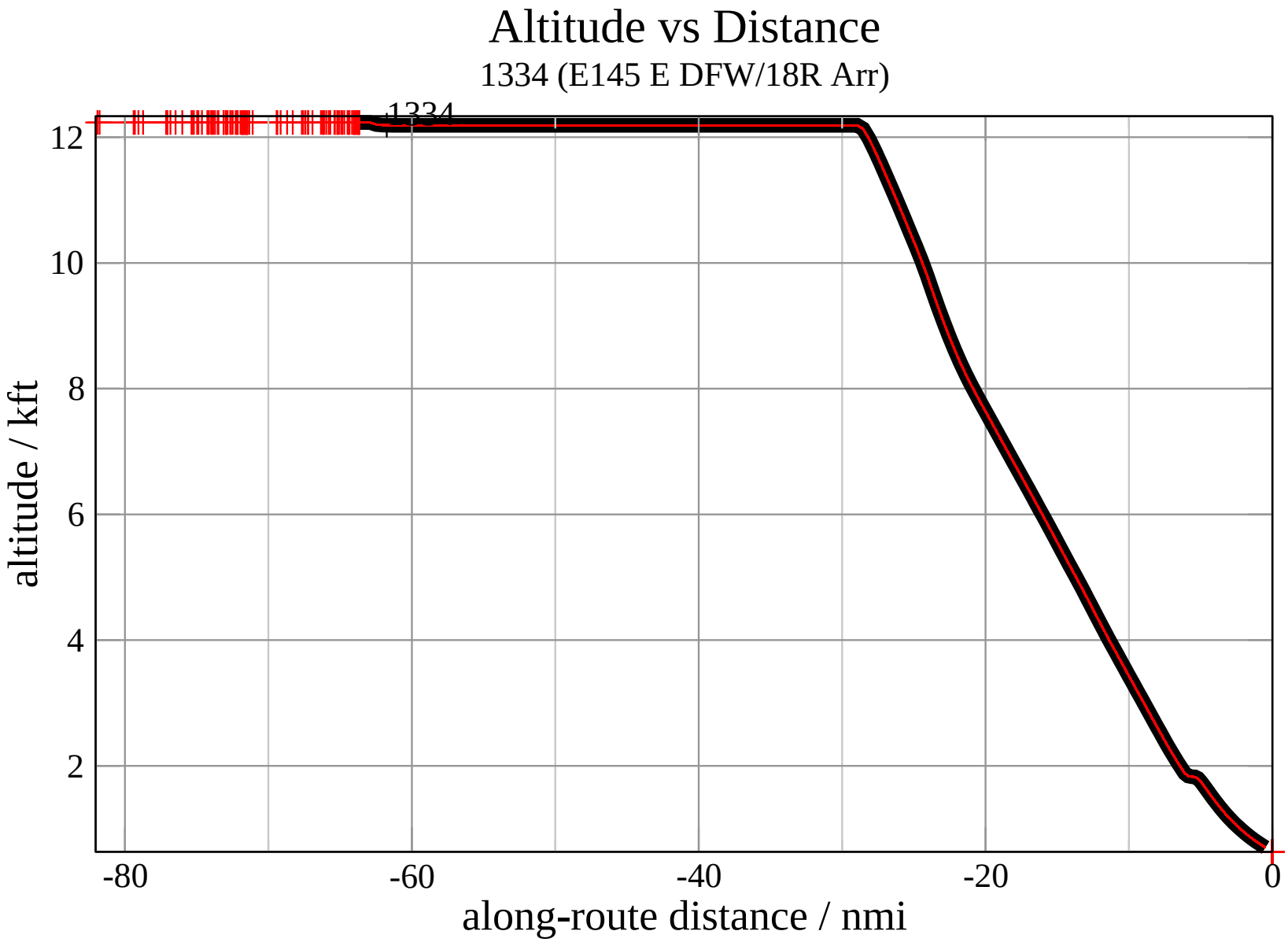
Departure Reroute Candidates

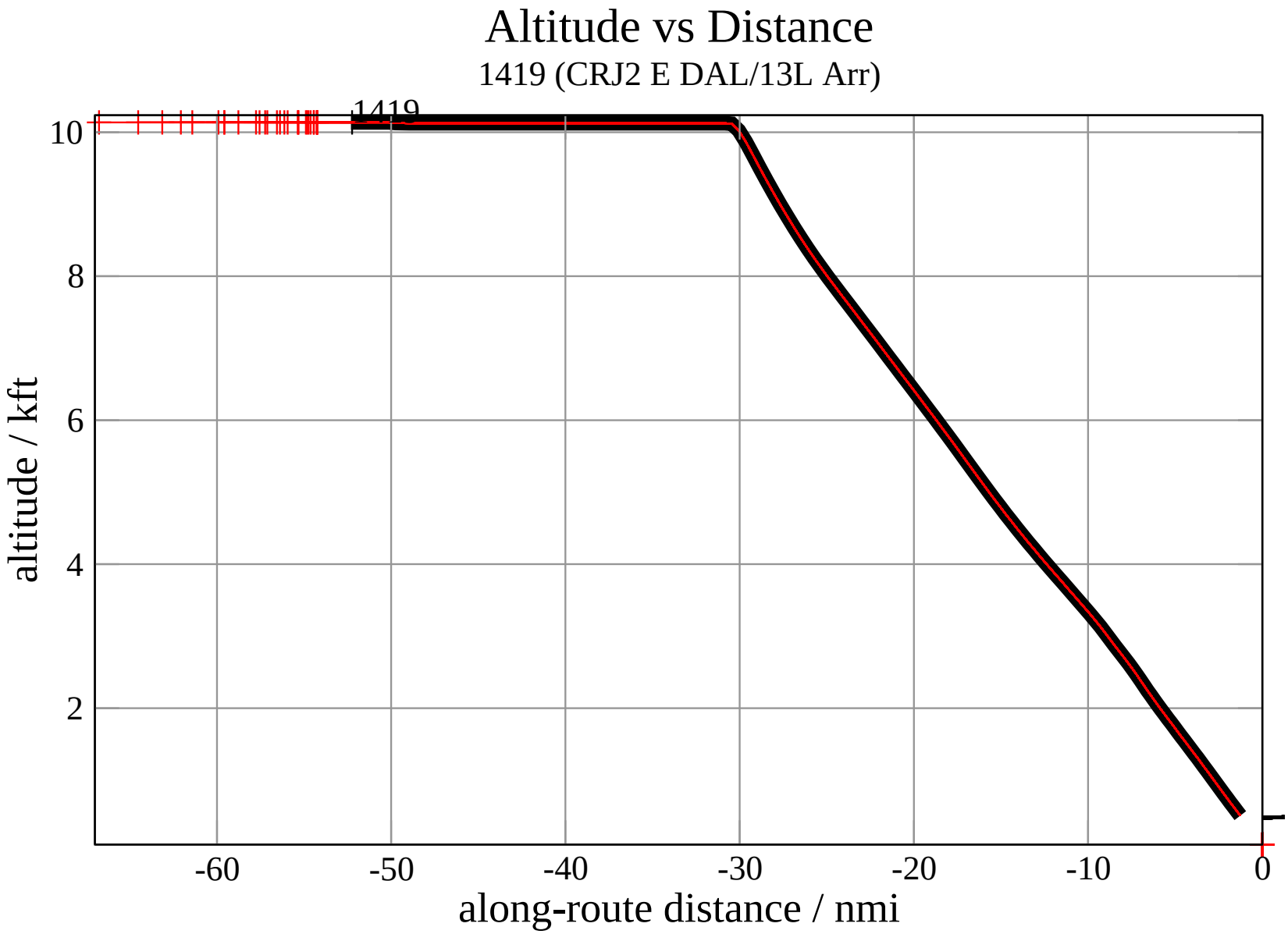
54 (E135 E DFW/17C Arr) 95 candidates

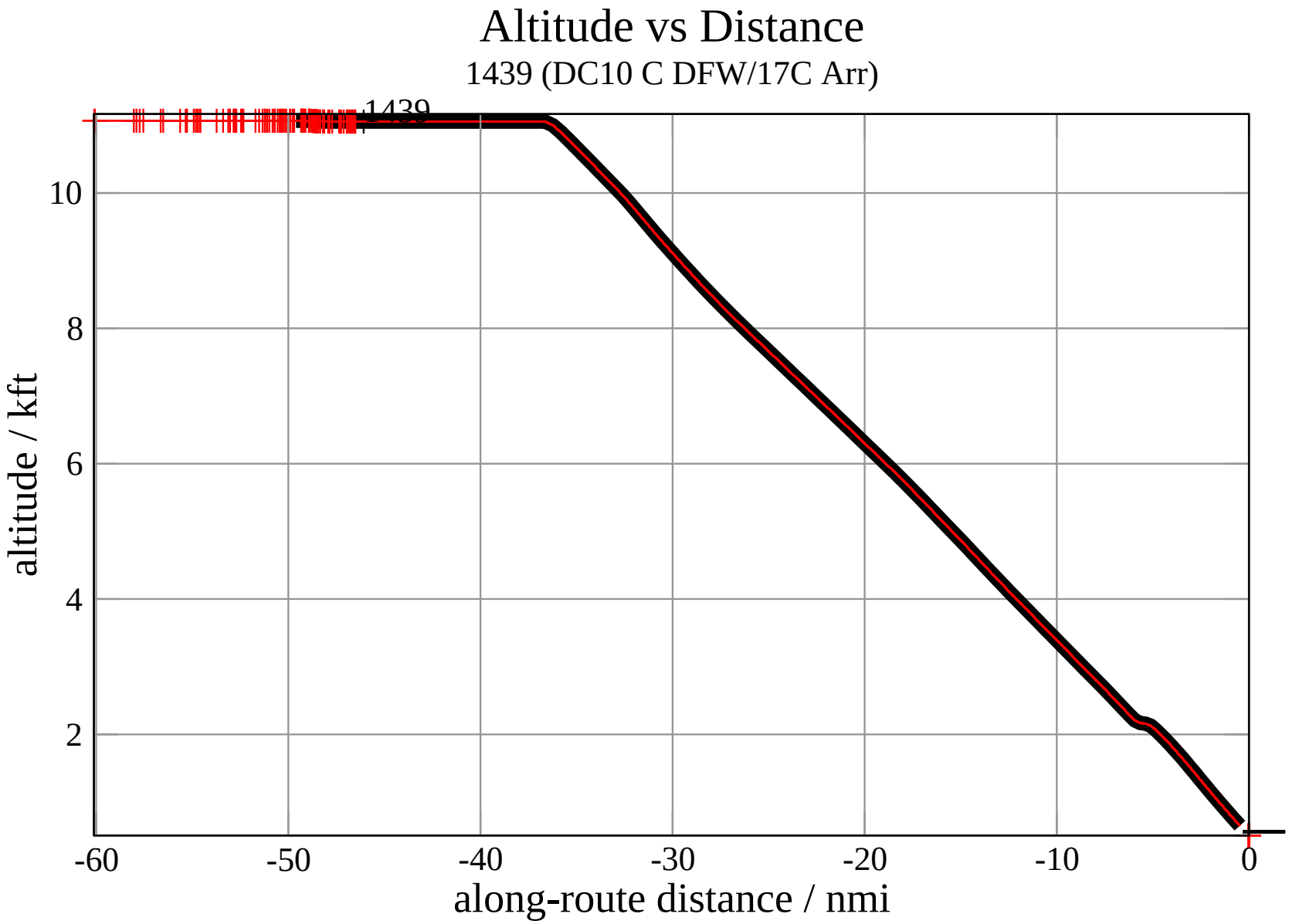


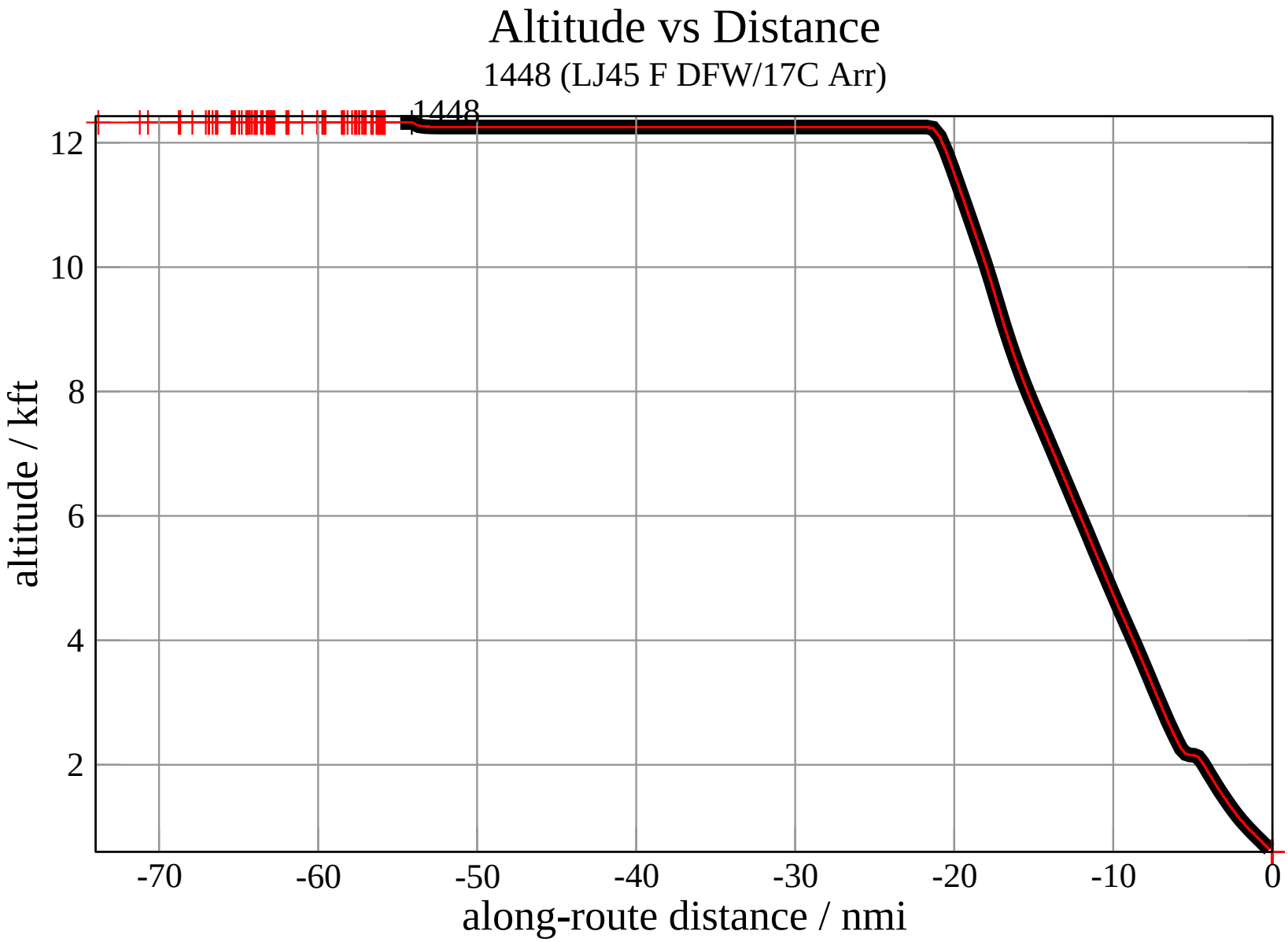

Altitude vs Distance
110 (B737 D DAL/13L Arr)
110
8
6
4
2
altitude / kft
-70
-60
-50
-40
-30
-20
-10
0
along-route distance / nmi

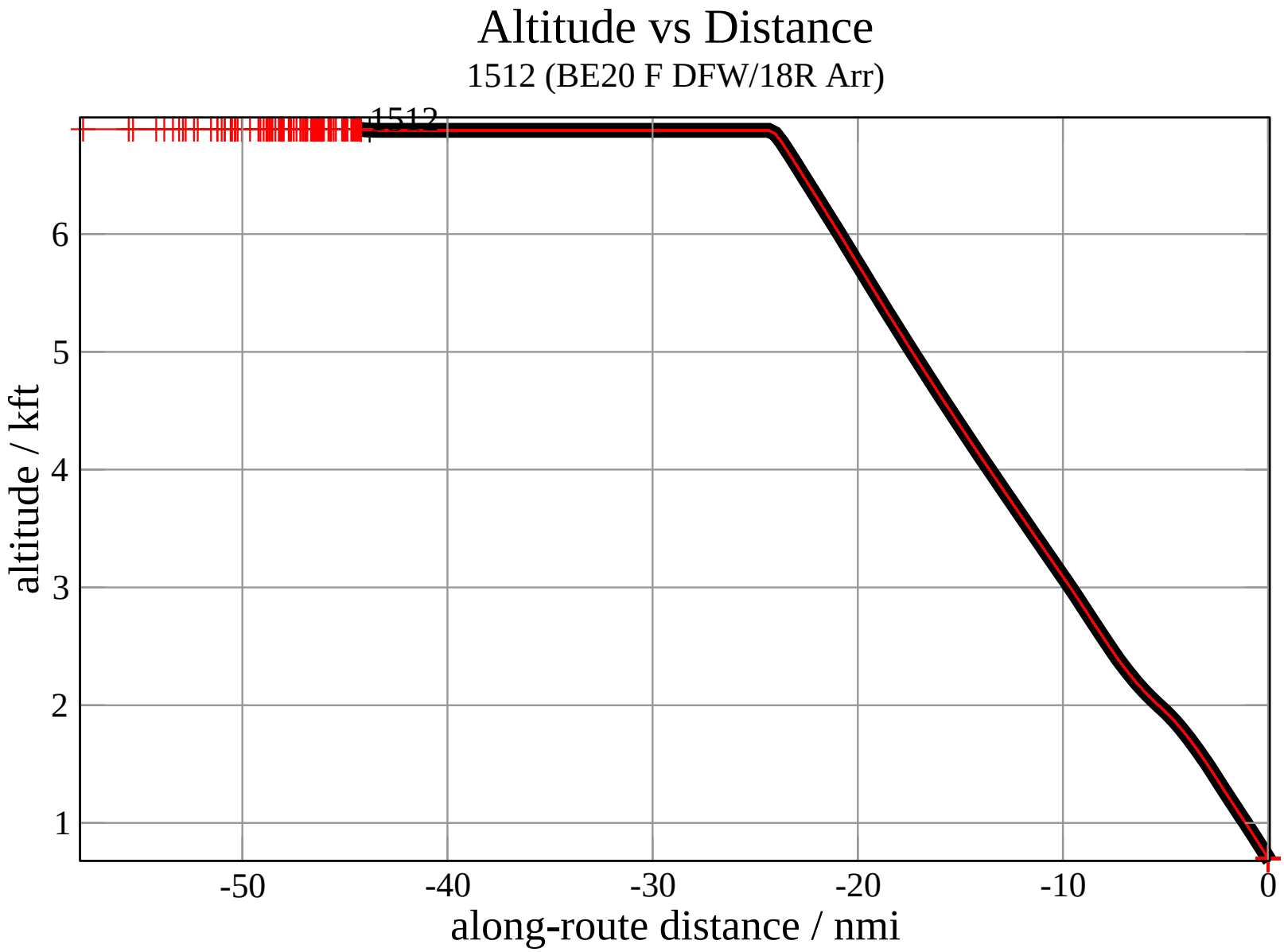

Altitude vs Distance
1322 (BE20 F DAL/13L Arr)
1322
8
6
4
2
0
altitude / kft
-60
-50
-40
-30
-20
-10
0
along-route distance / nmi

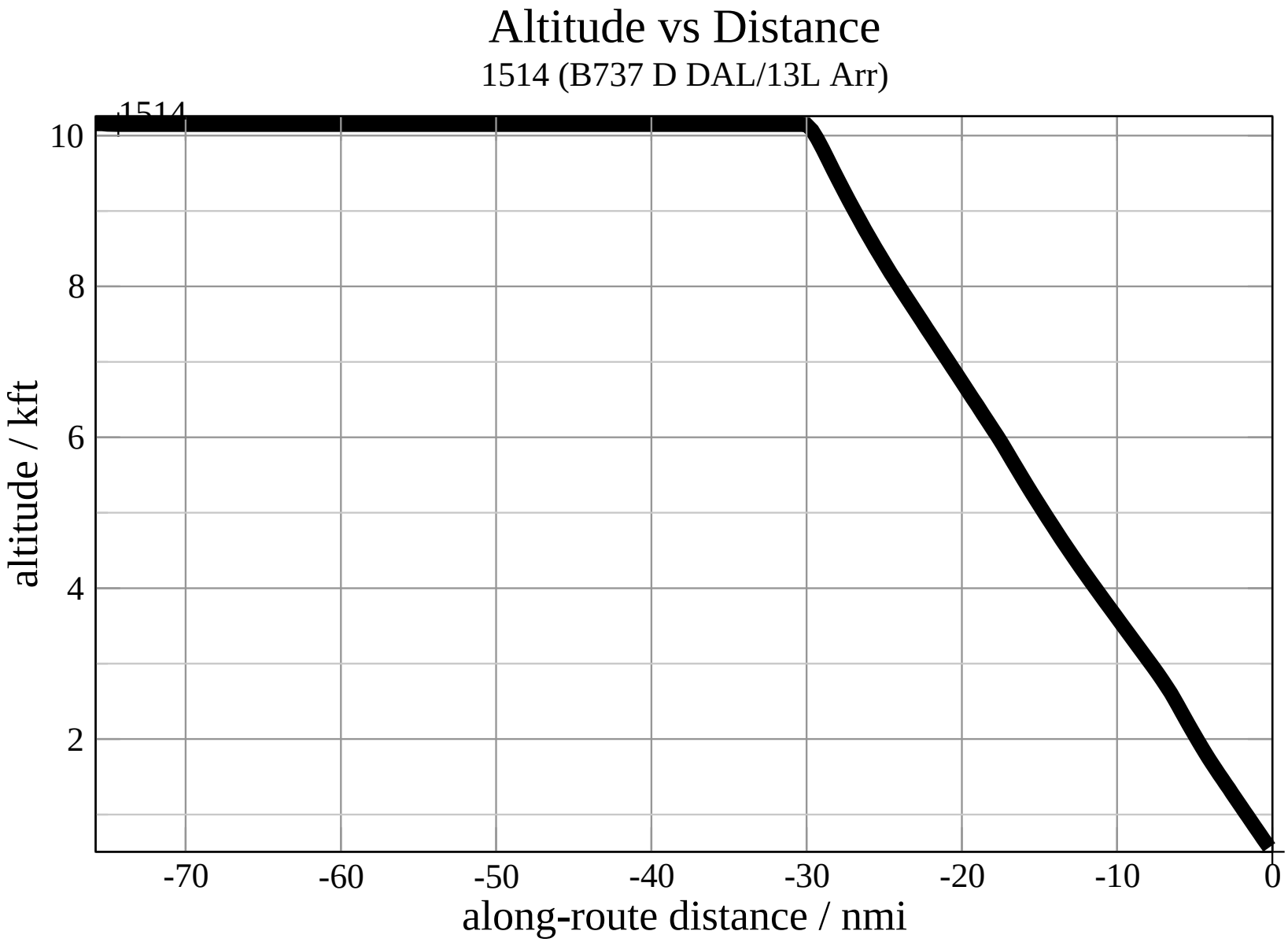

Altitude vs Distance
1334 (E145 E DFW/18R Arr)
1334
12
10
8
6
4
2
altitude / kft
-80
-60
-40
-20
0
along-route distance / nmi

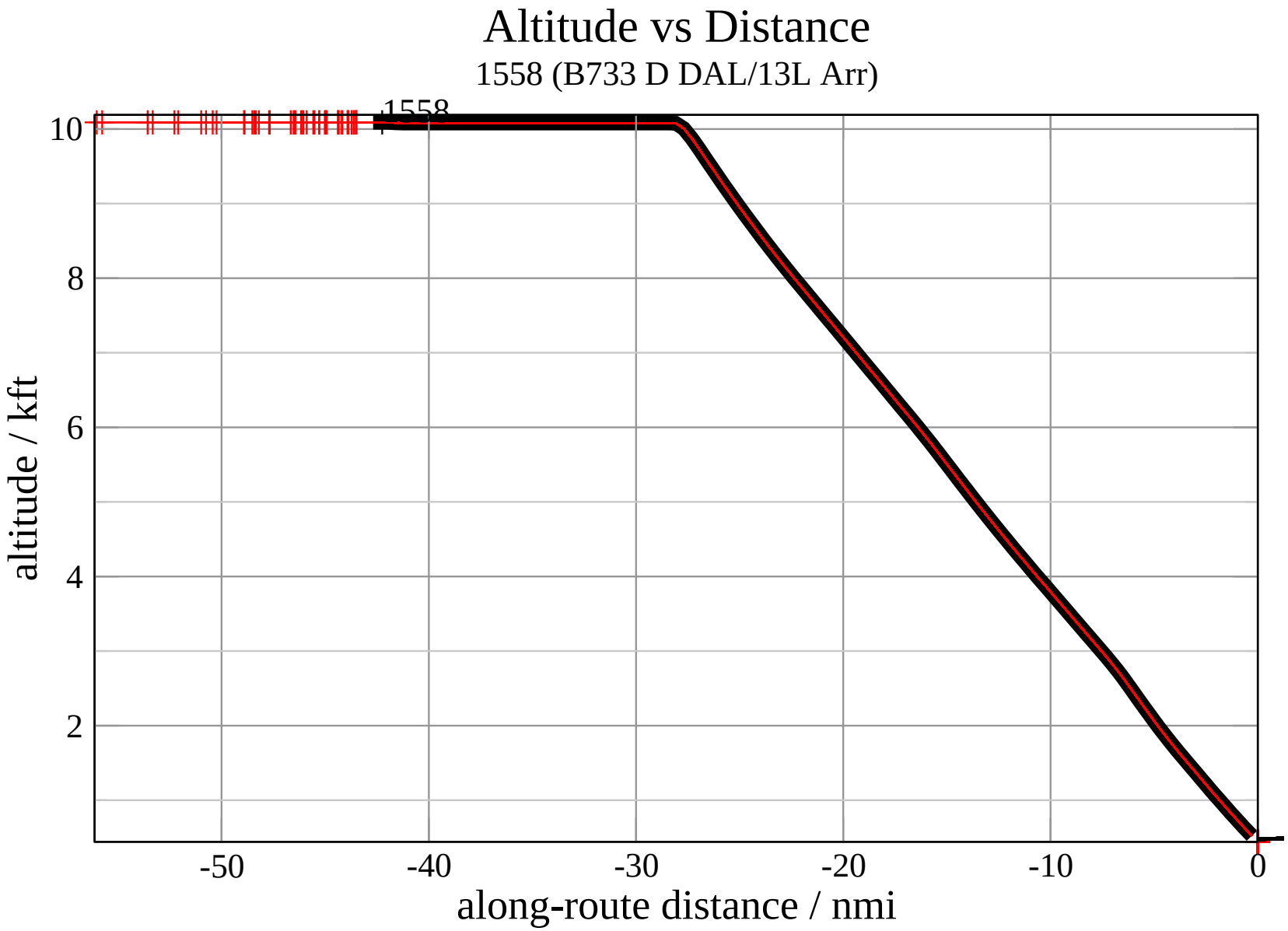

Altitude vs Distance
1419 (CRJ2 E DAL/13L Arr)
1419
10
8
6
4
2
altitude / kft
-60
-50
-40
-30
-20
-10
0
along-route distance / nmi

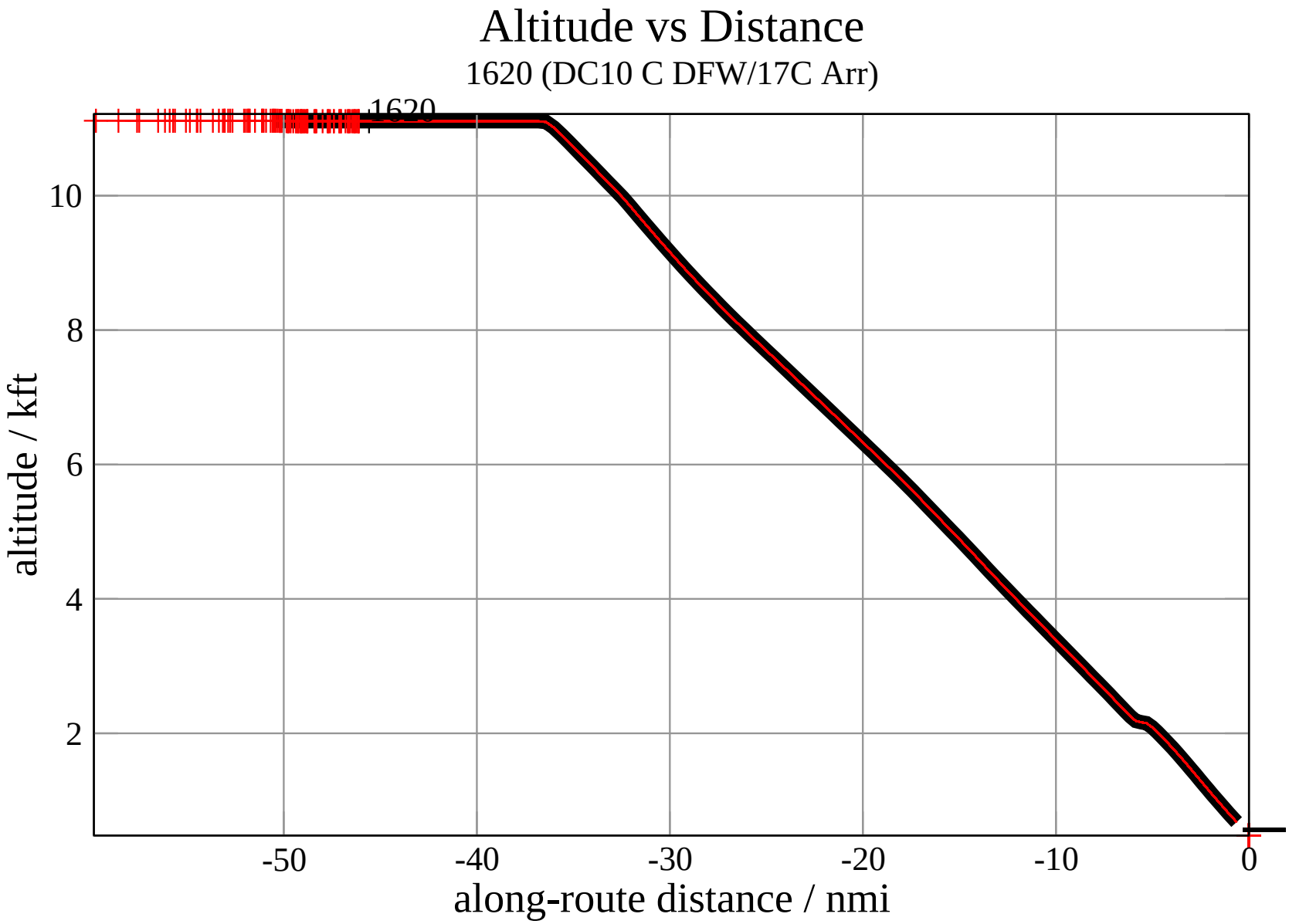

Altitude vs Distance
1439 (DC10 C DFW/17C Arr)
1439
10
8
6
4
2
altitude / kft
-60
-50
-40
-30
-20
-10
0
along-route distance / nmi

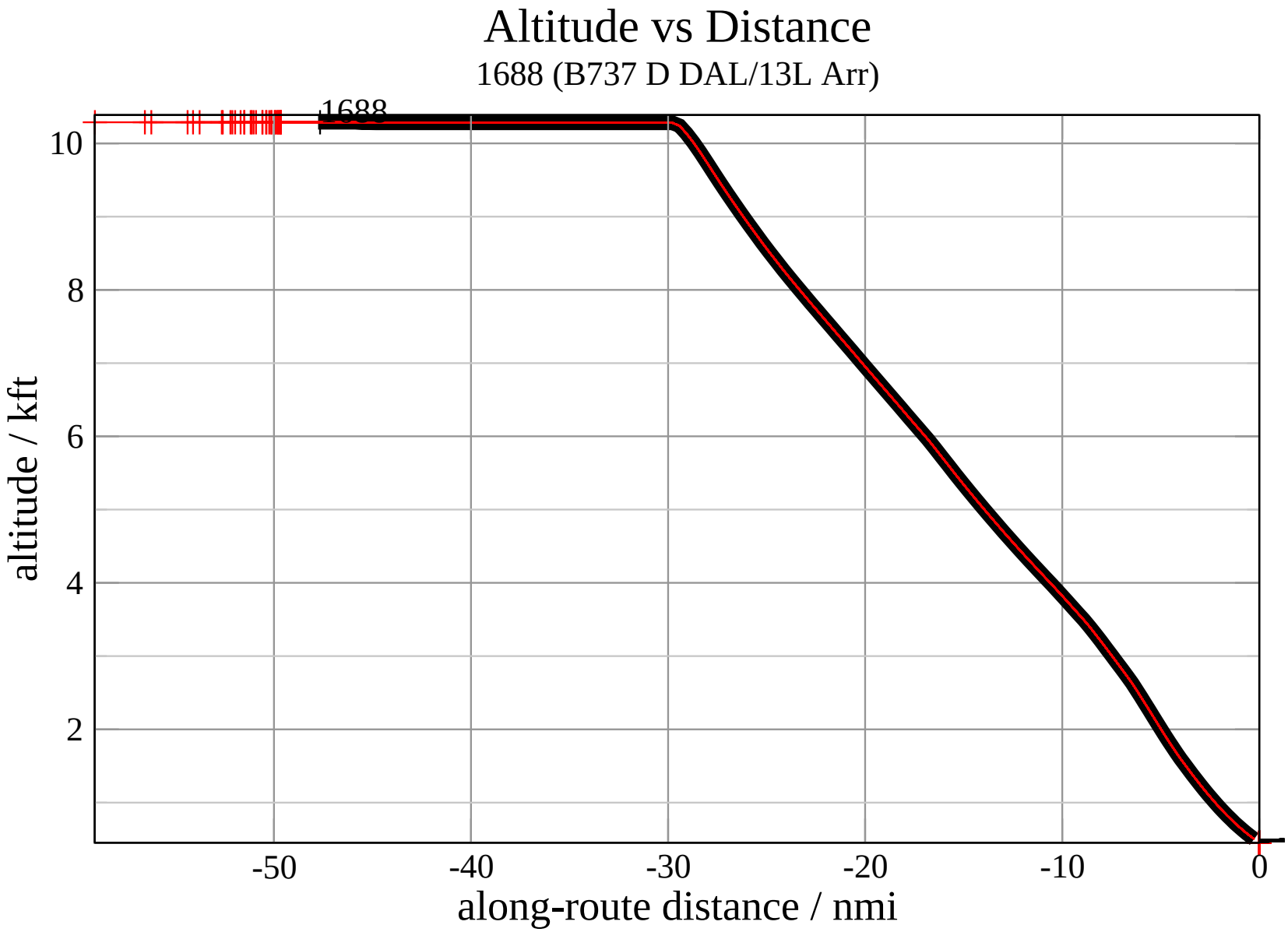

Altitude vs Distance
1448 (LJ45 F DFW/17C Arr)
1448
12
10
8
6
4
2
altitude / kft
-70
-60
-50
-40
-30
-20
-10
0
along-route distance / nmi

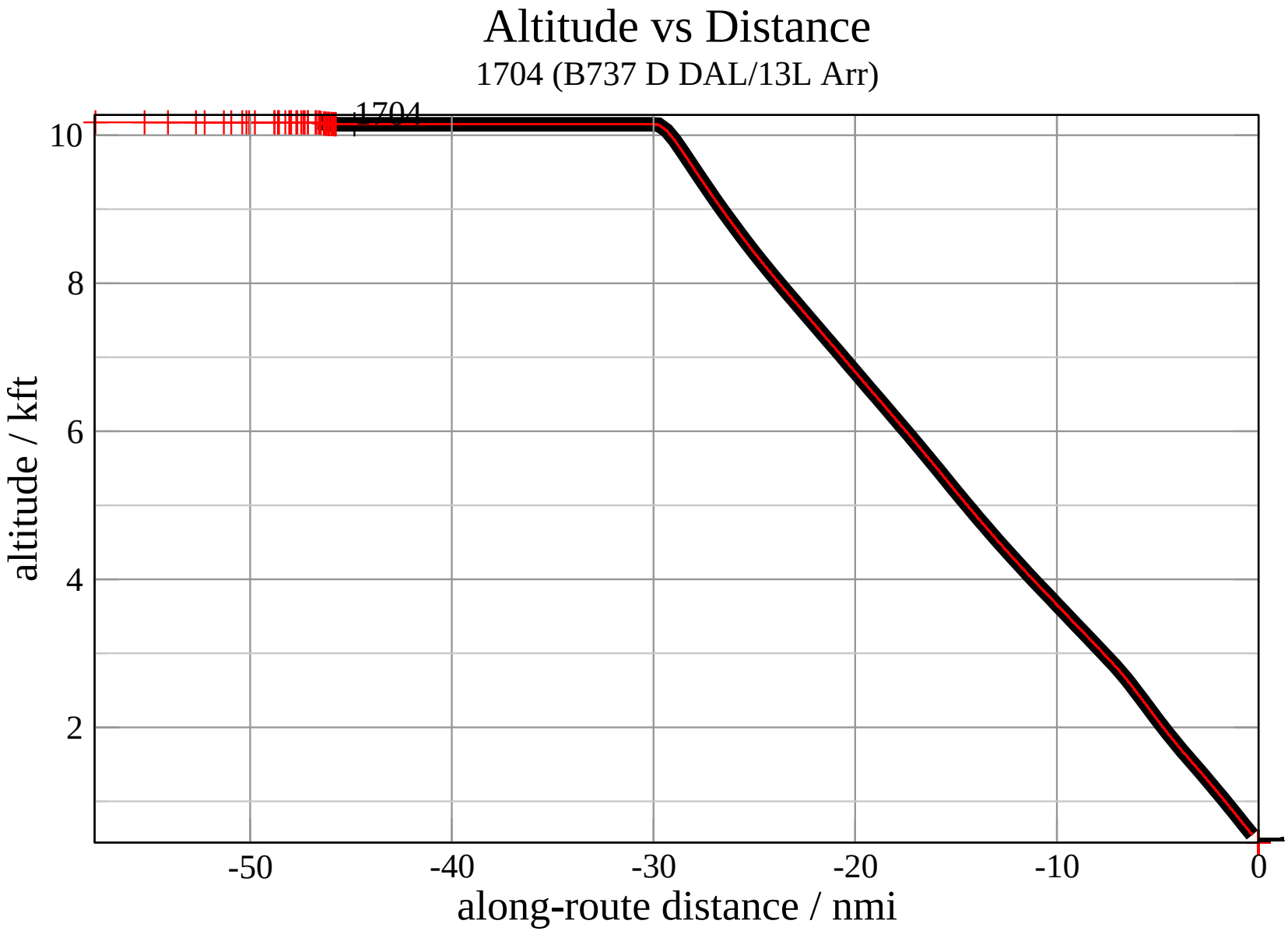

Altitude vs Distance
1512 (BE20 F DFW/18R Arr)
1512
altitude / kft
6
5
4
3
2
1
-50
-40
-30
-20
-10
0
along-route distance / nmi

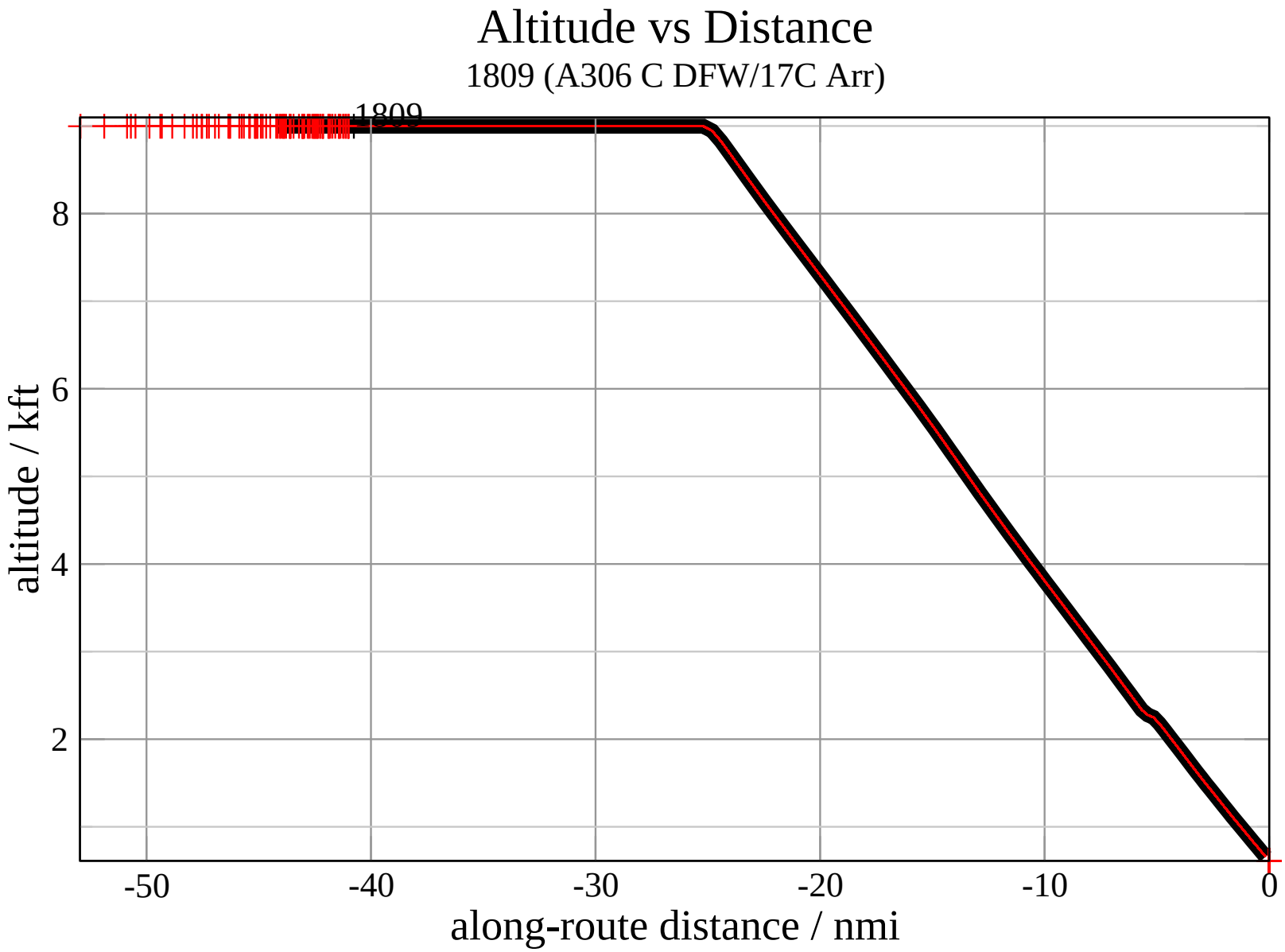

Altitude vs Distance
1514 (B737 D DAL/13L Arr)
1514
10
8
6
4
2
altitude / kft
-70
-60
-50
-40
-30
-20
-10
0
along-route distance / nmi

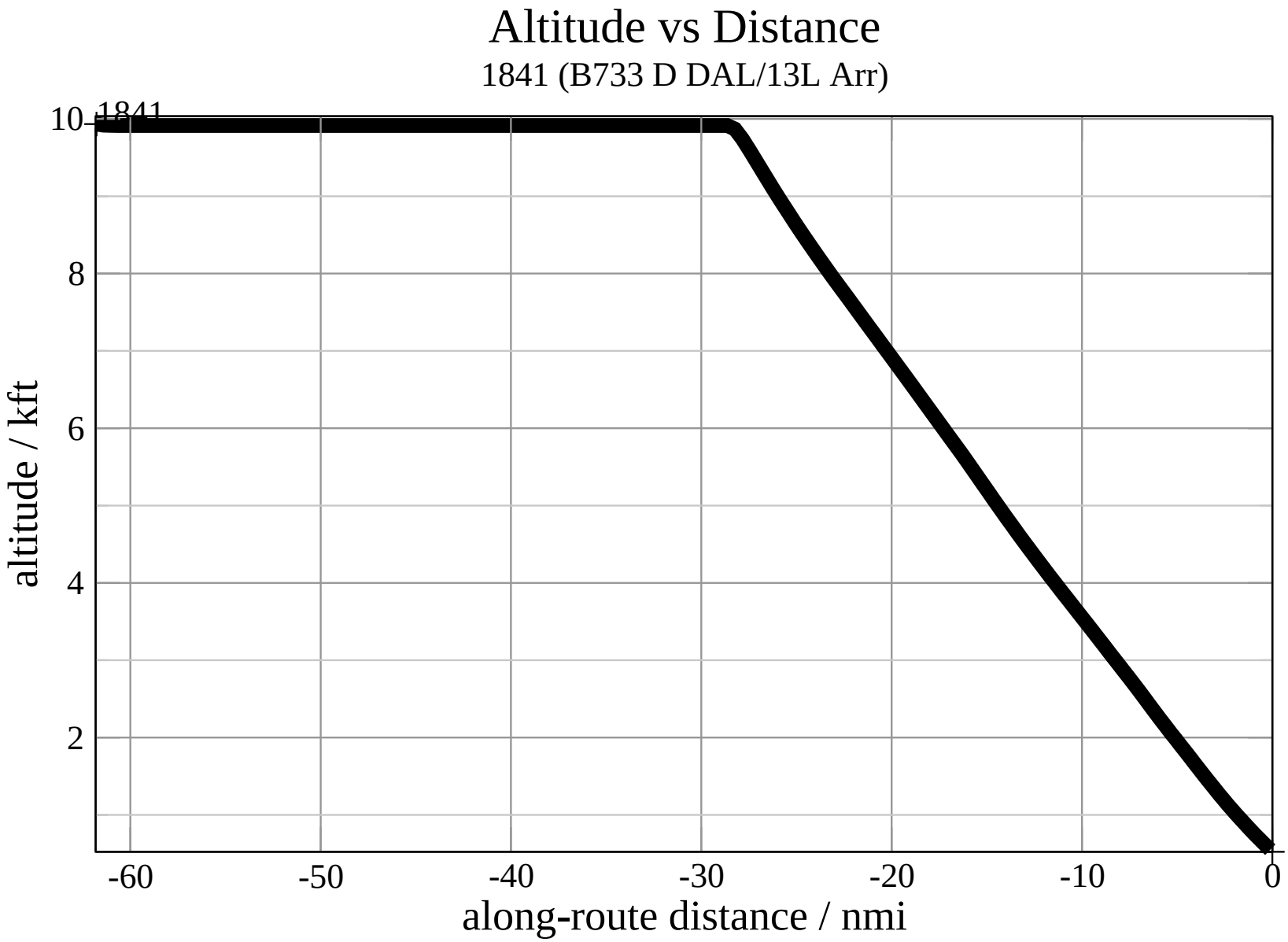

Altitude vs Distance
1558 (B733 D DAL/13L Arr)
1558
10
8
6
4
2
altitude / kft
-50
-40
-30
-20
-10
0
along-route distance / nmi

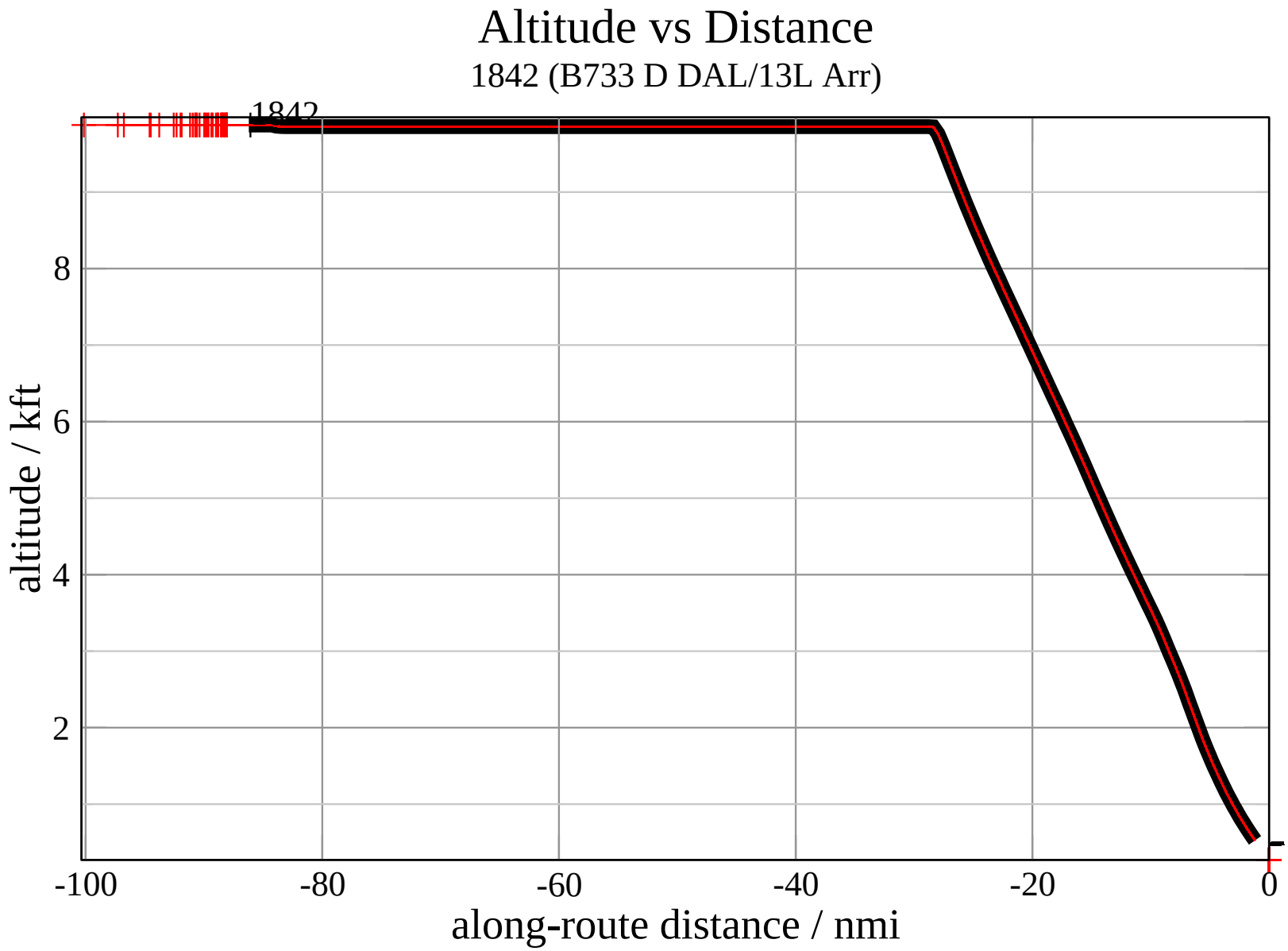

Altitude vs Distance
1620 (DC10 C DFW/17C Arr)
1620
10
8
6
4
2
altitude / kft
-50
-40
-30
-20
-10
0
along-route distance / nmi

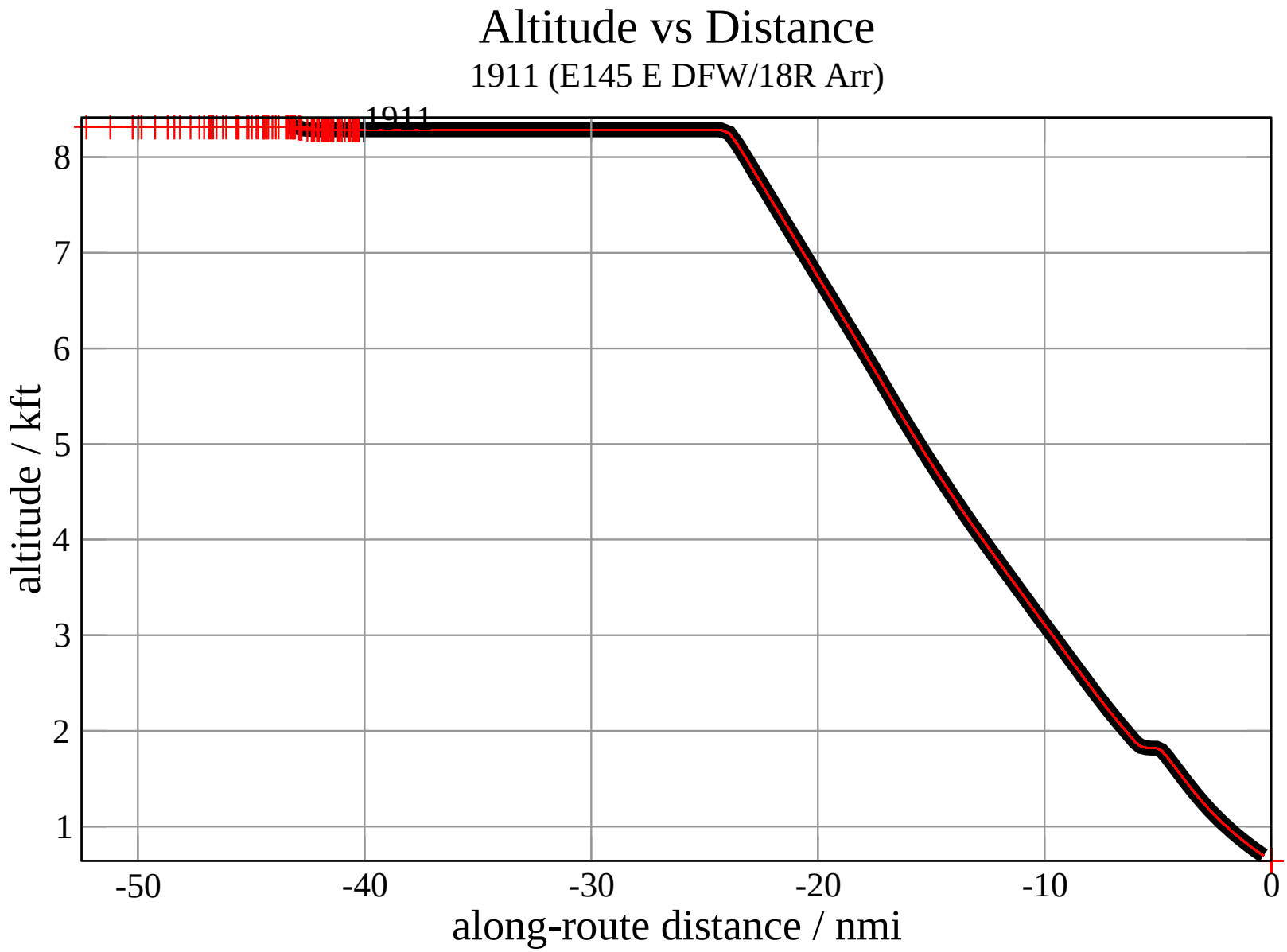

Altitude vs Distance
1688 (B737 D DAL/13L Arr)
1688
10
8
6
4
2
altitude / kft
-50
-40
-30
-20
-10
0
along-route distance / nmi

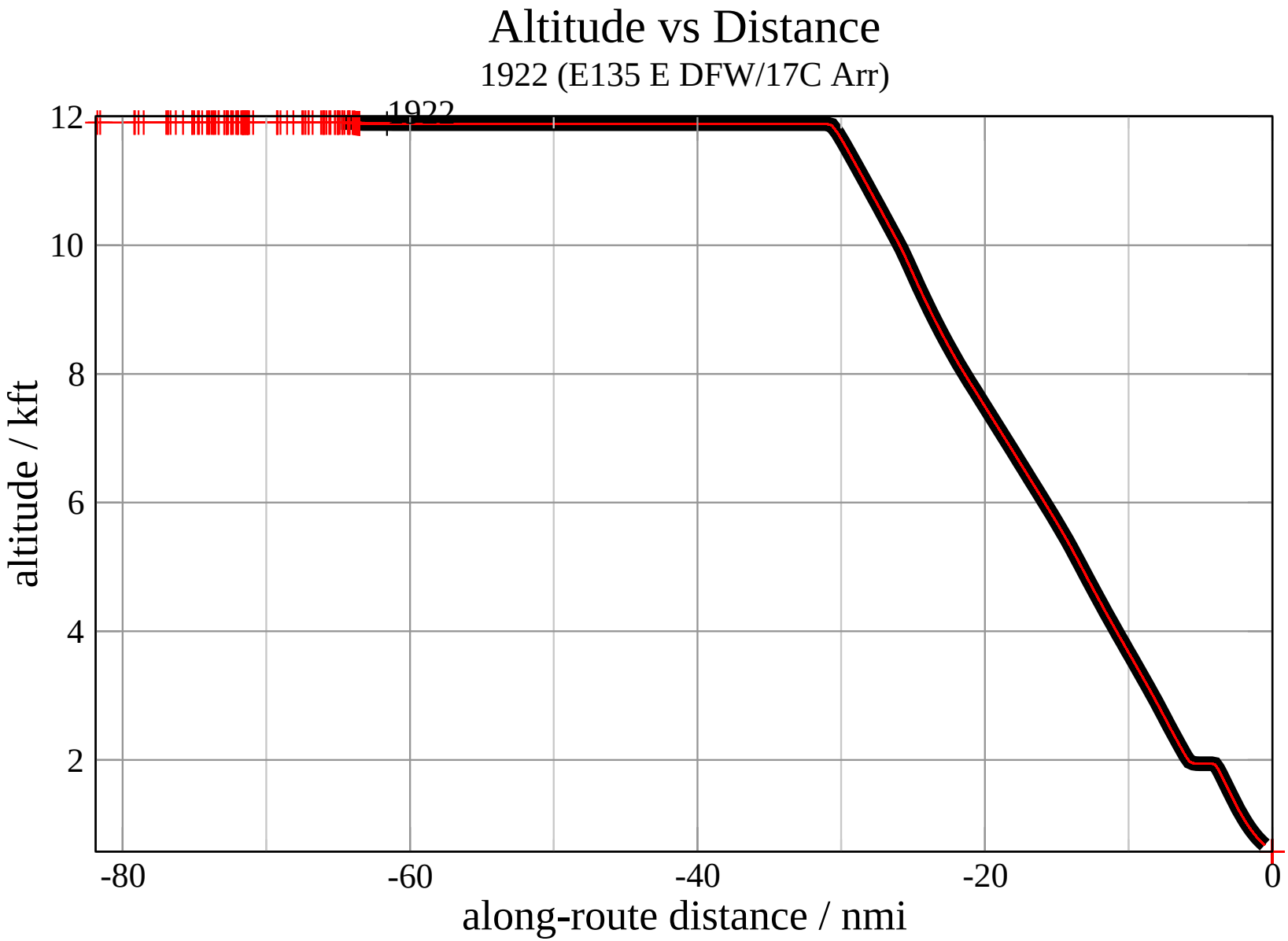

Altitude vs Distance
1704 (B737 D DAL/13L Arr)
1704
10
8
6
4
2
altitude / kft
-50
-40
-30
-20
-10
0
along-route distance / nmi

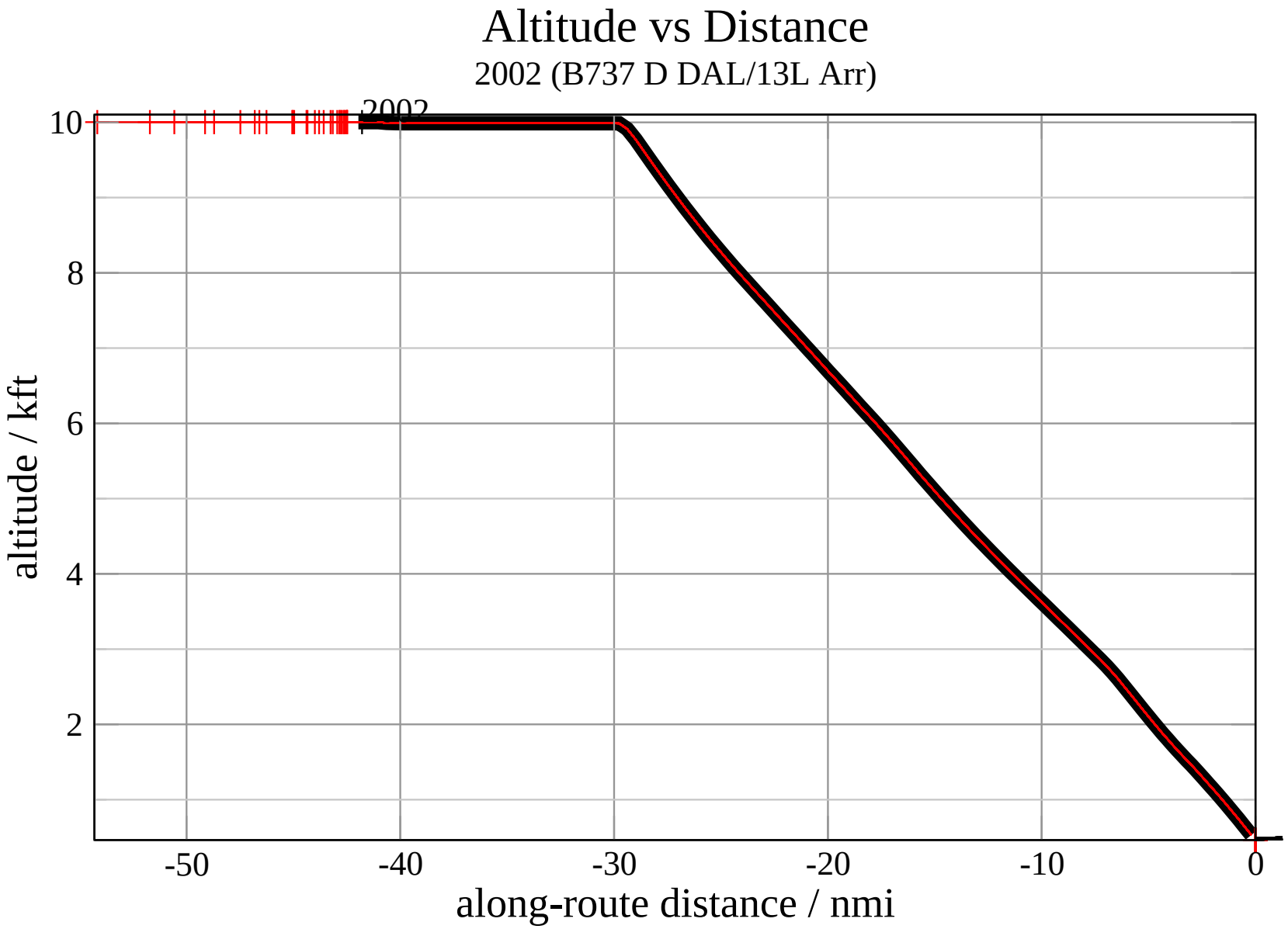

Altitude vs Distance
1809 (A306 C DFW/17C Arr)
1809
8
6
4
2
altitude / kft
-50
-40
-30
-20
-10
0
along-route distance / nmi

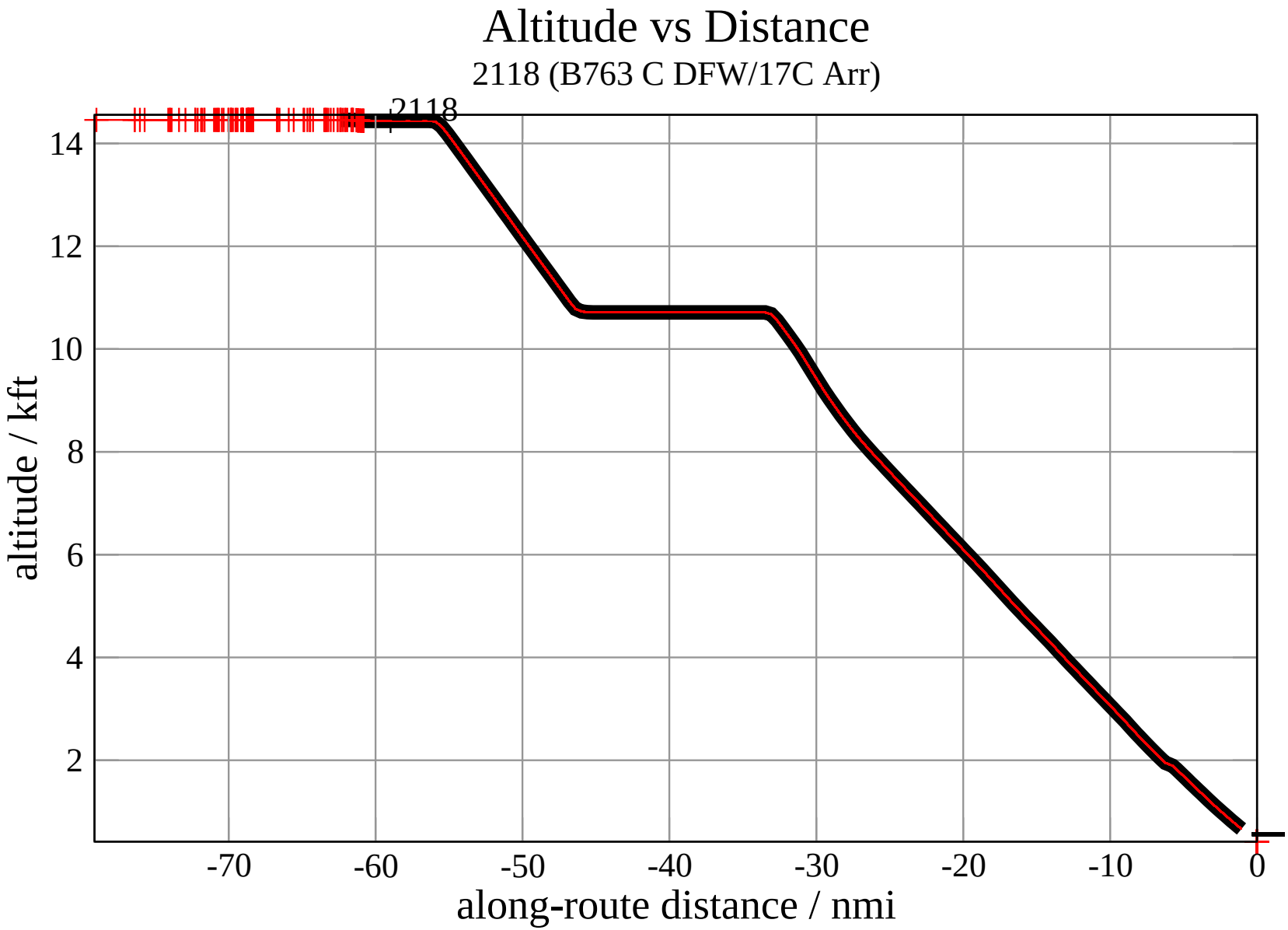

Altitude vs Distance
1841 (B733 D DAL/13L Arr)
1841
10
8
6
4
2
altitude / kft
-60
-50
-40
-30
-20
-10
0
along-route distance / nmi

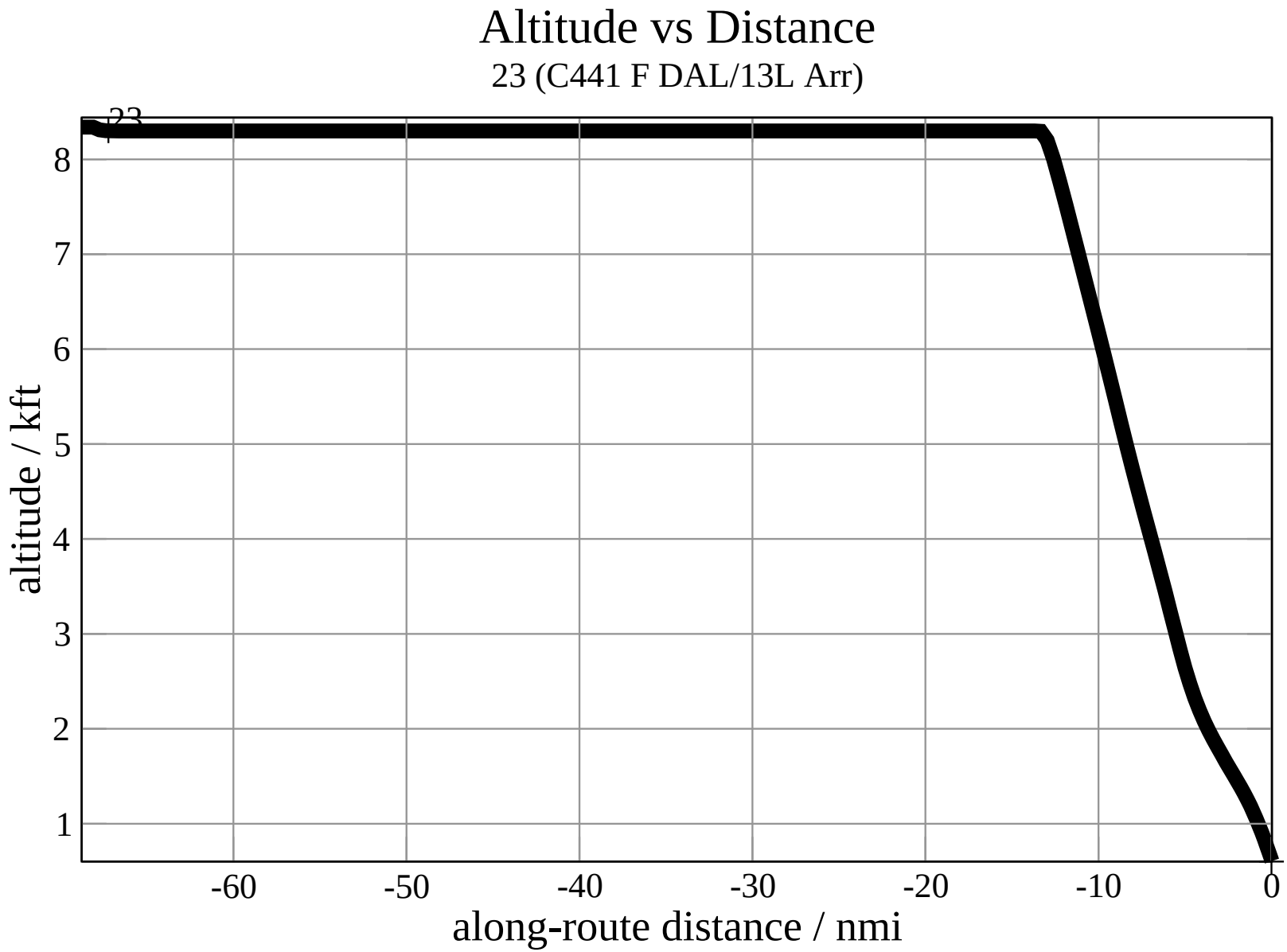

Altitude vs Distance
1842 (B733 D DAL/13L Arr)
1842
8
6
4
2
altitude / kft
-100
-80
-60
-40
-20
0
along-route distance / nmi

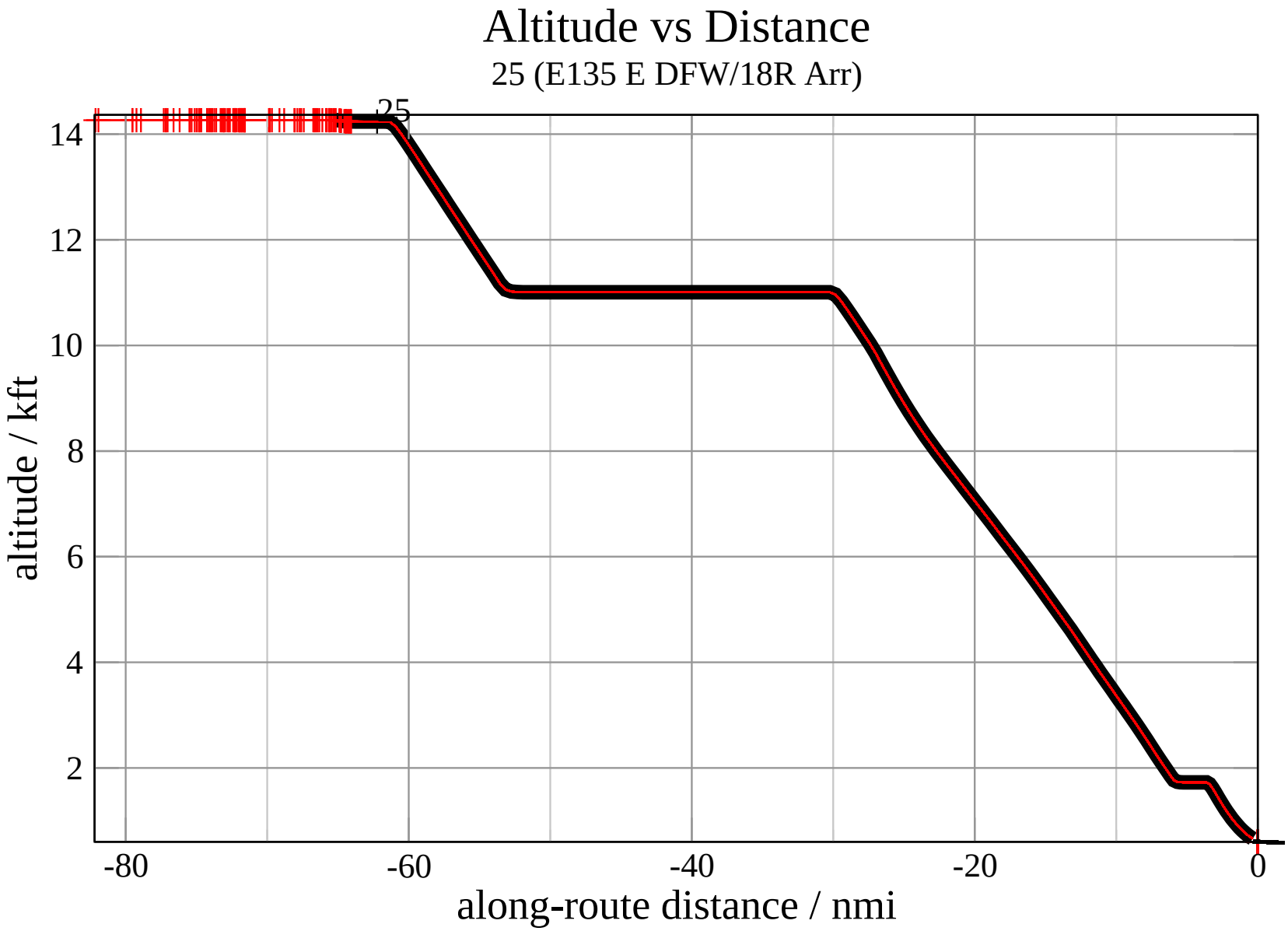

Altitude vs Distance
1911 (E145 E DFW/18R Arr)
1911
8
7
6
5
4
3
2
1
altitude / kft
-50
-40
-30
-20
-10
0
along-route distance / nmi

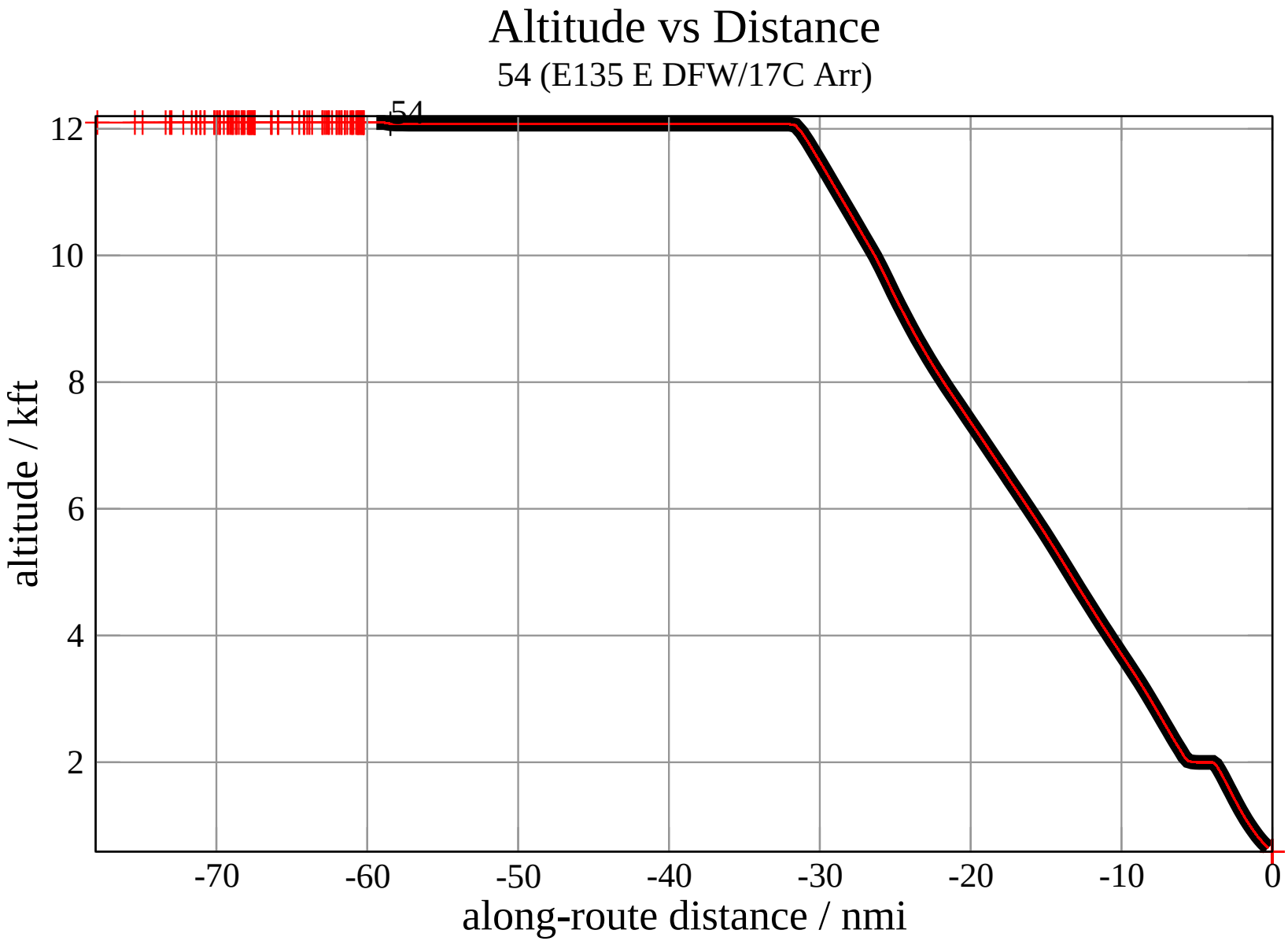

Altitude vs Distance
1922 (E135 E DFW/17C Arr)
1922
12
10
8
6
4
2
altitude / kft
-80
-60
-40
-20
0
along-route distance / nmi

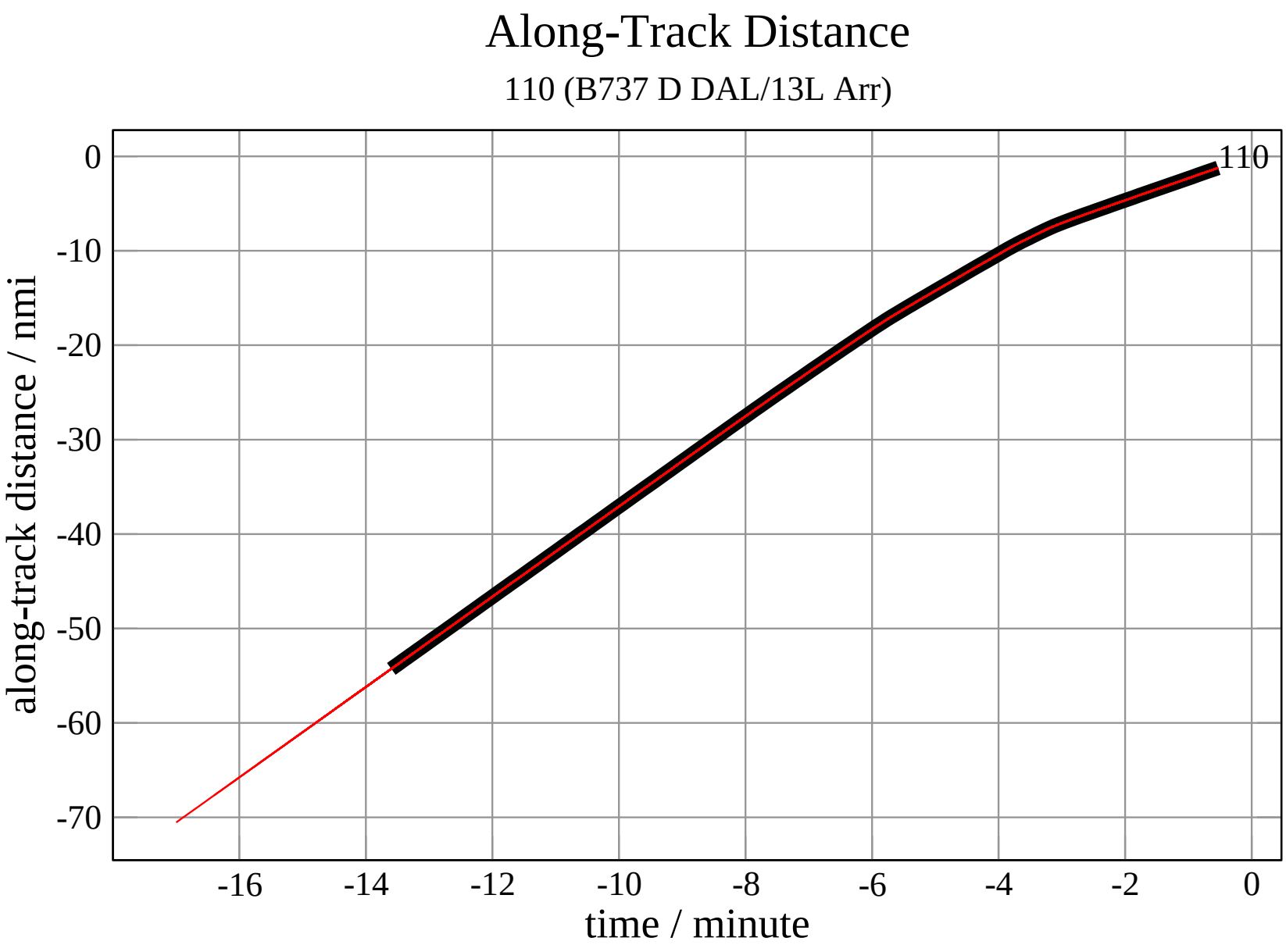

Altitude vs Distance
2002 (B737 D DAL/13L Arr)
2002
10
8
6
4
2
altitude / kft
-50
-40
-30
-20
-10
0
along-route distance / nmi

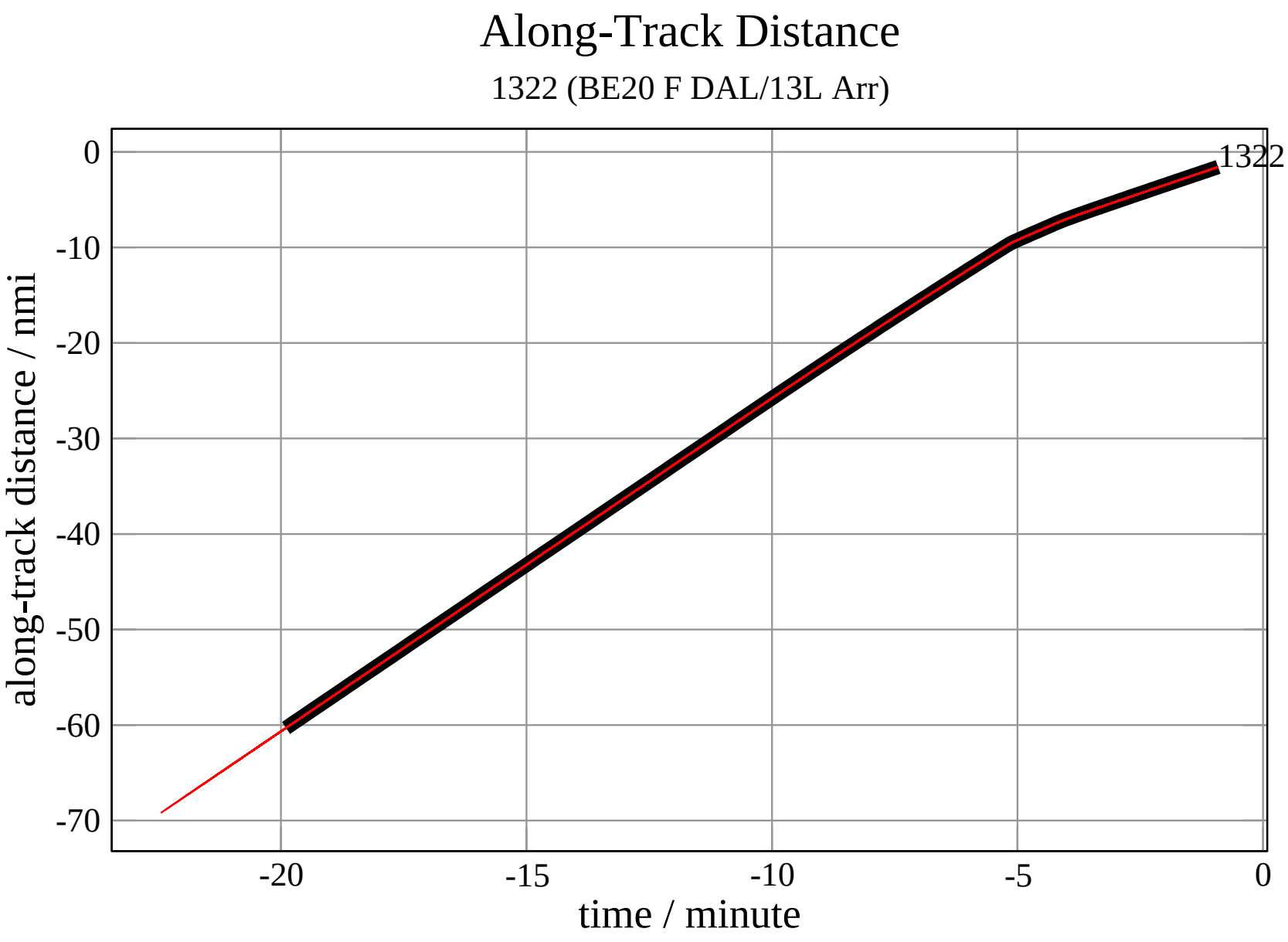

Altitude vs Distance
2118 (B763 C DFW/17C Arr)
2118
14
12
10
8
6
4
2
altitude / kft
-70
-60
-50
-40
-30
-20
-10
0
along-route distance / nmi

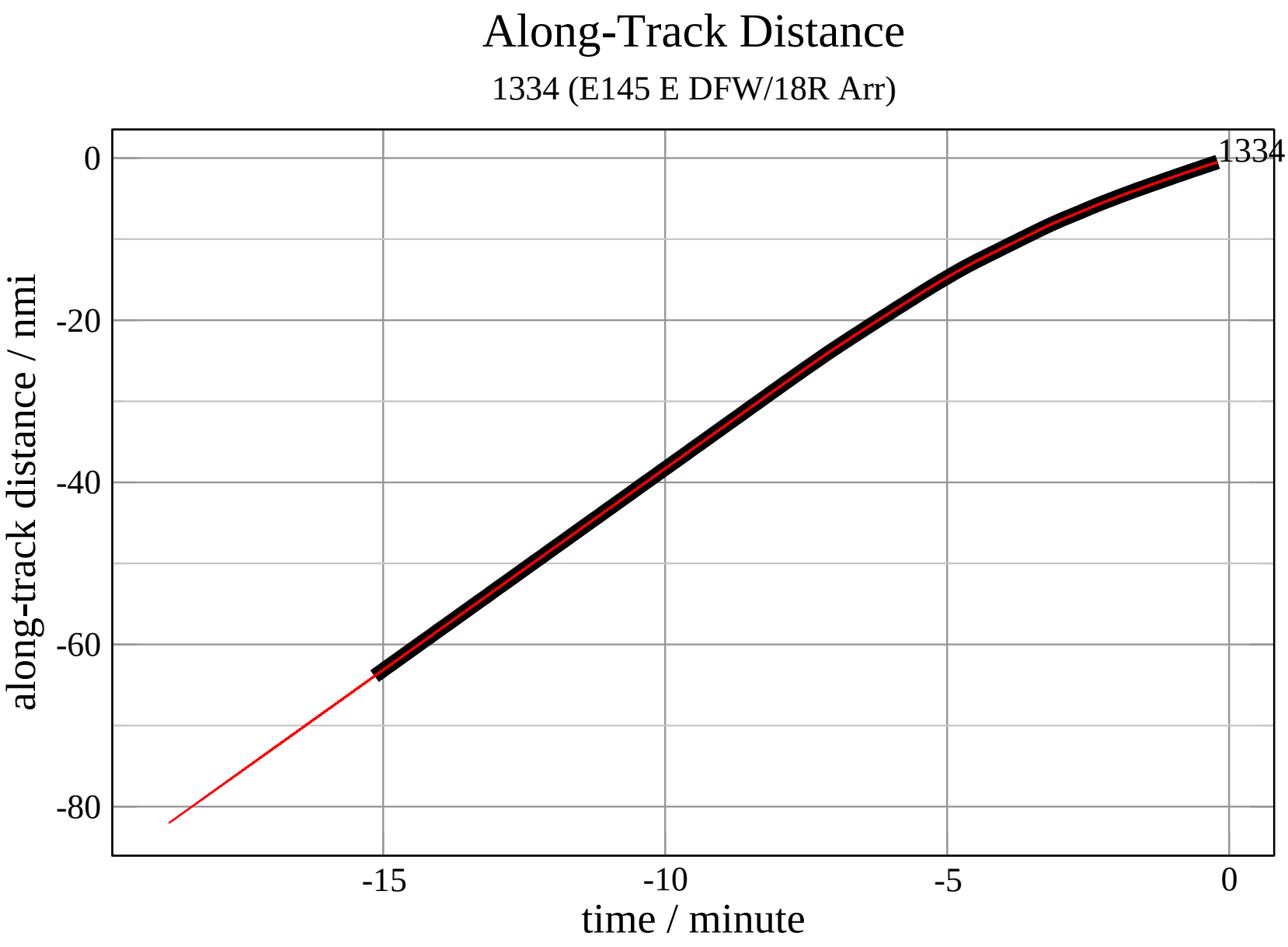

Altitude vs Distance
23 (C441 F DAL/13L Arr)
23
8
7
6
5
4
3
2
1
altitude / kft
-60
-50
-40
-30
-20
-10
0
along-route distance / nmi

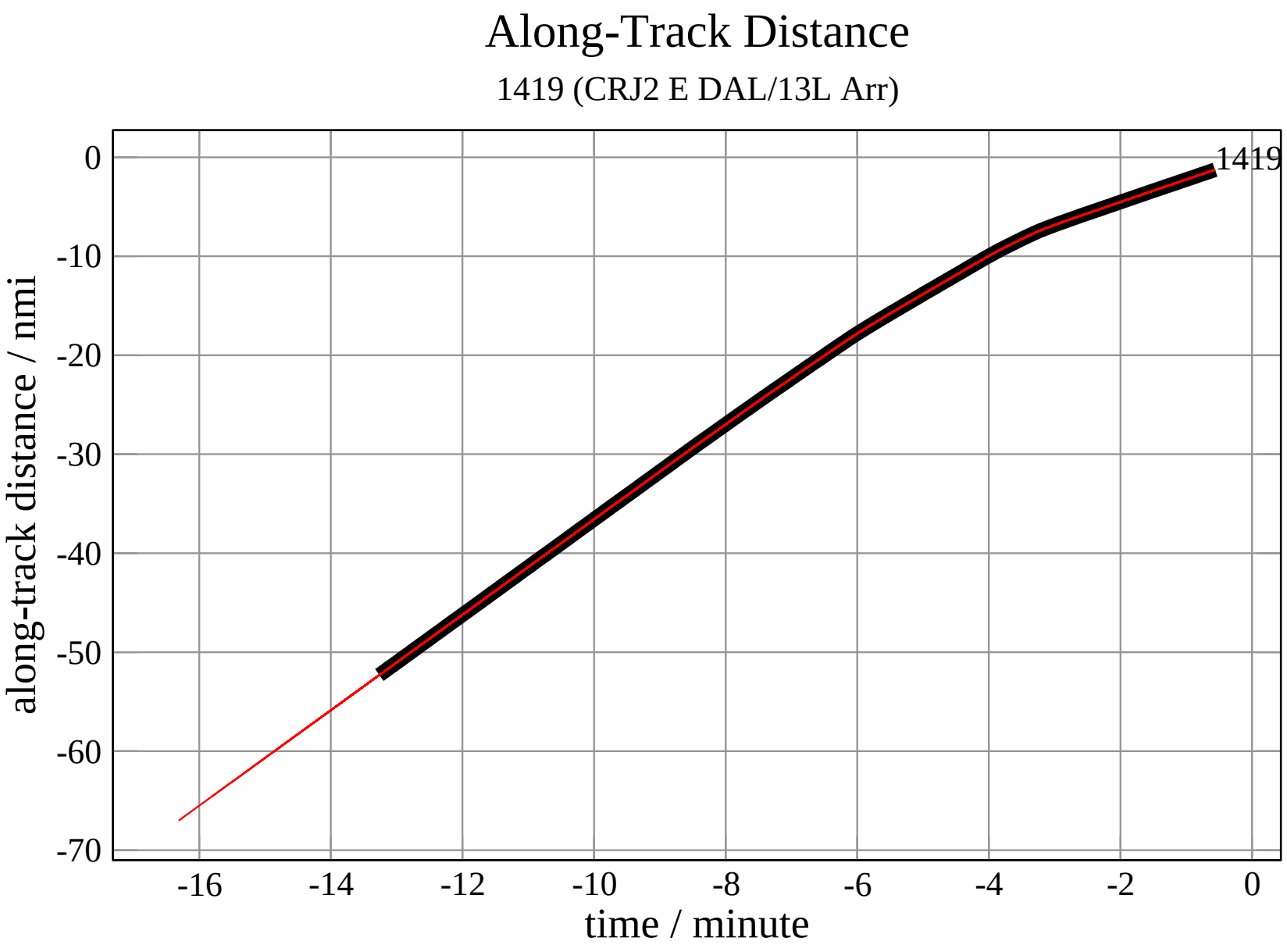

Altitude vs Distance
25 (E135 E DFW/18R Arr)
25
14
12
10
8
6
4
2
altitude / kft
-80
-60
-40
-20
0
along-route distance / nmi

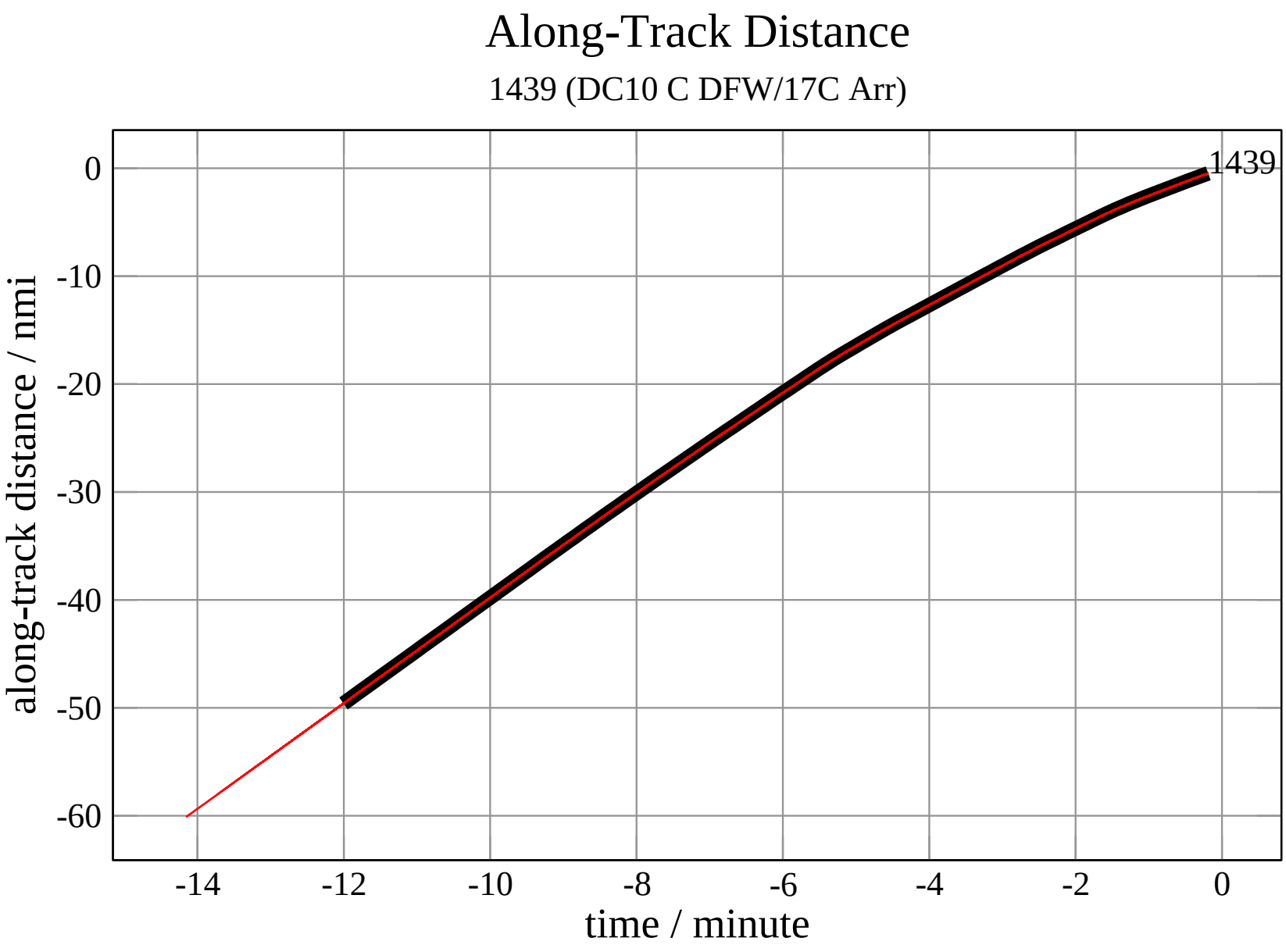

Altitude vs Distance
54 (E135 E DFW/17C Arr)
54
12
10
8
6
4
2
altitude / kft
-70
-60
-50
-40
-30
-20
-10
0
along-route distance / nmi

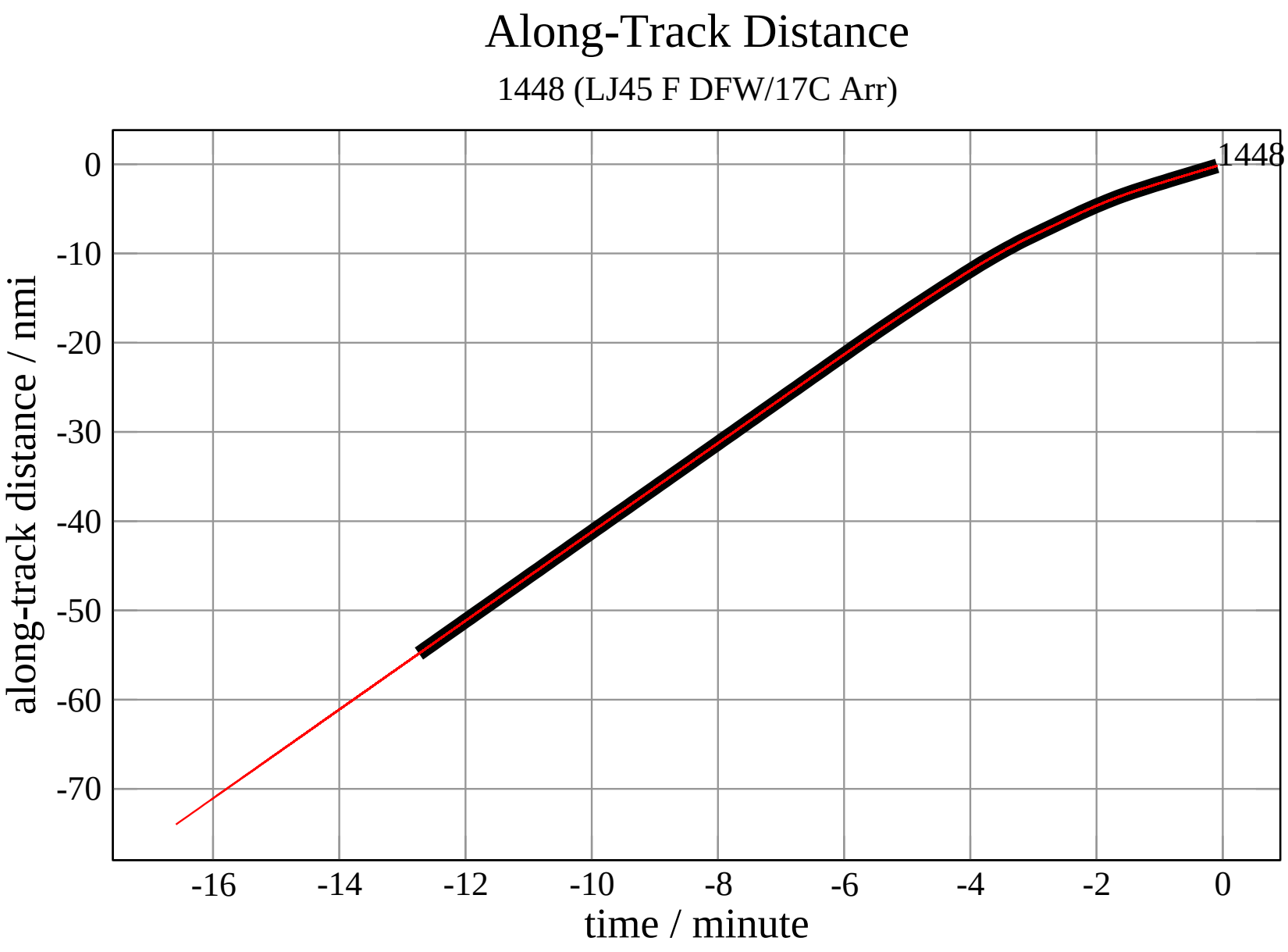

Along-Track Distance
110 (B737 D DAL/13L Arr)
110
0
-10
-20
-30
-40
-50
-60
-70
along-track distance / nmi
-16
-14
-12
-10
-8
-6
-4
-2
0
time / minute

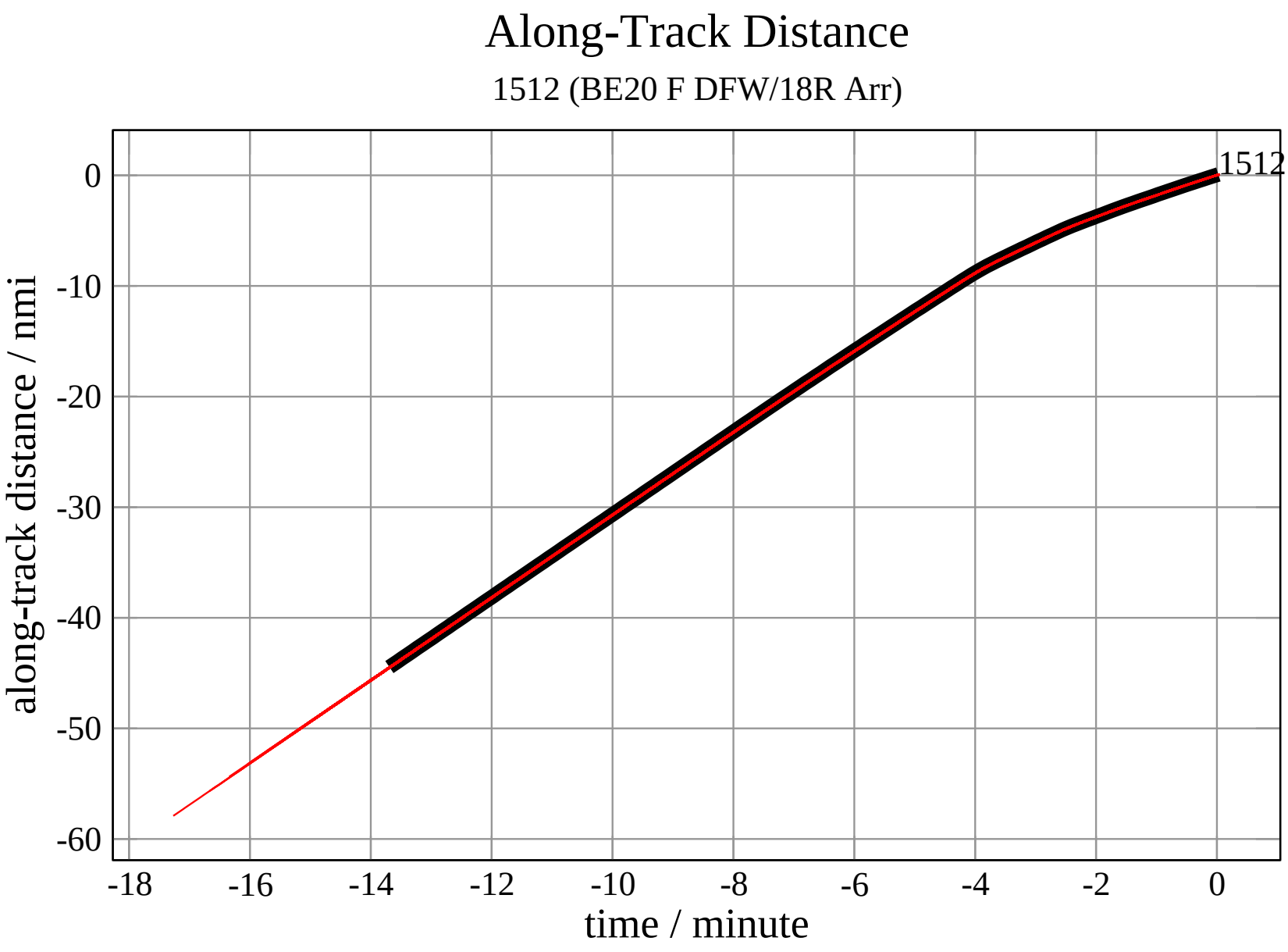

Along-Track Distance
1322 (BE20 F DAL/13L Arr)
1322
0
-10
-20
-30
-40
-50
-60
-70
along-track distance / nmi
-20
-15
-10
-5
0
time / minute

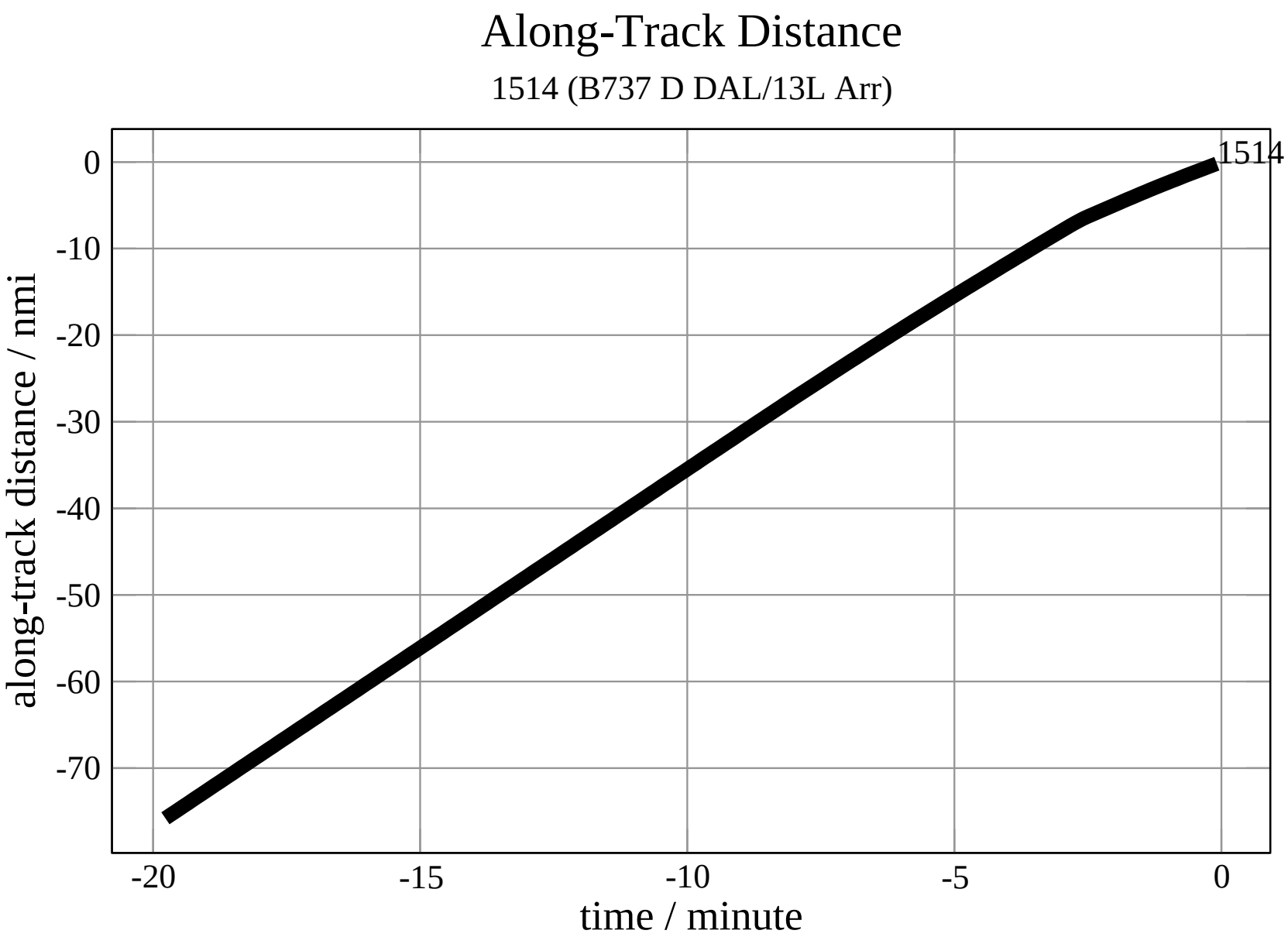

Along-Track Distance
1334 (E145 E DFW/18R Arr)
1334
0
-20
-40
-60
-80
along-track distance / nmi
-15
-10
-5
0
time / minute


Along-Track Distance
1419 (CRJ2 E DAL/13L Arr)
1419
0
-10
-20
-30
-40
-50
-60
-70
along-track distance / nmi
-16
-14
-12
-10
-8
-6
-4
-2
0
time / minute


Along-Track Distance
1439 (DC10 C DFW/17C Arr)
1439
0
-10
-20
-30
-40
-50
-60
along-track distance / nmi
-14
-12
-10
-8
-6
-4
-2
0
time / minute

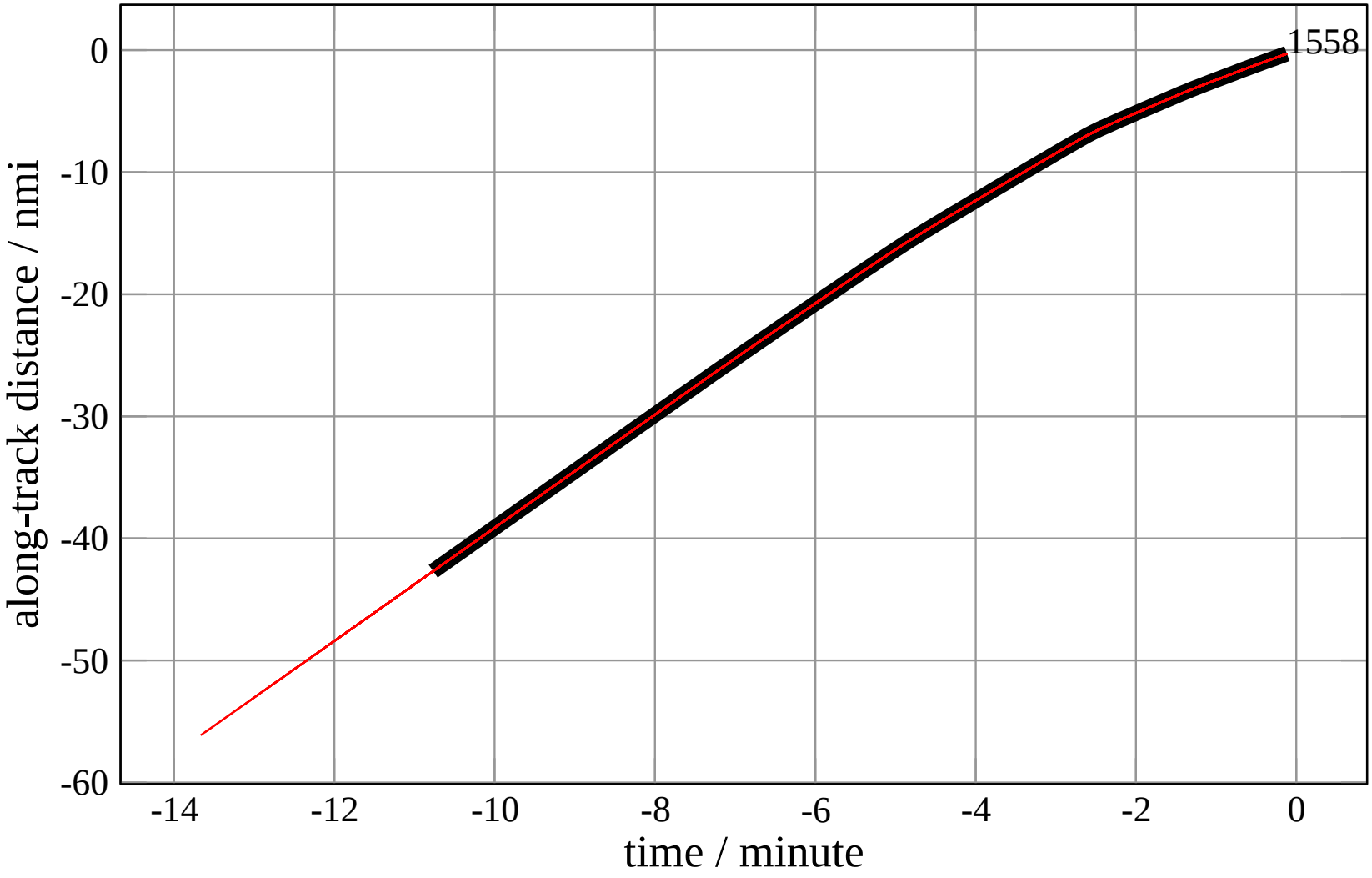

Along-Track Distance
1448 (LJ45 F DFW/17C Arr)
1448
0
-10
-20
-30
-40
-50
-60
-70
along-track distance / nmi
-16
-14
-12
-10
-8
-6
-4
-2
0
time / minute

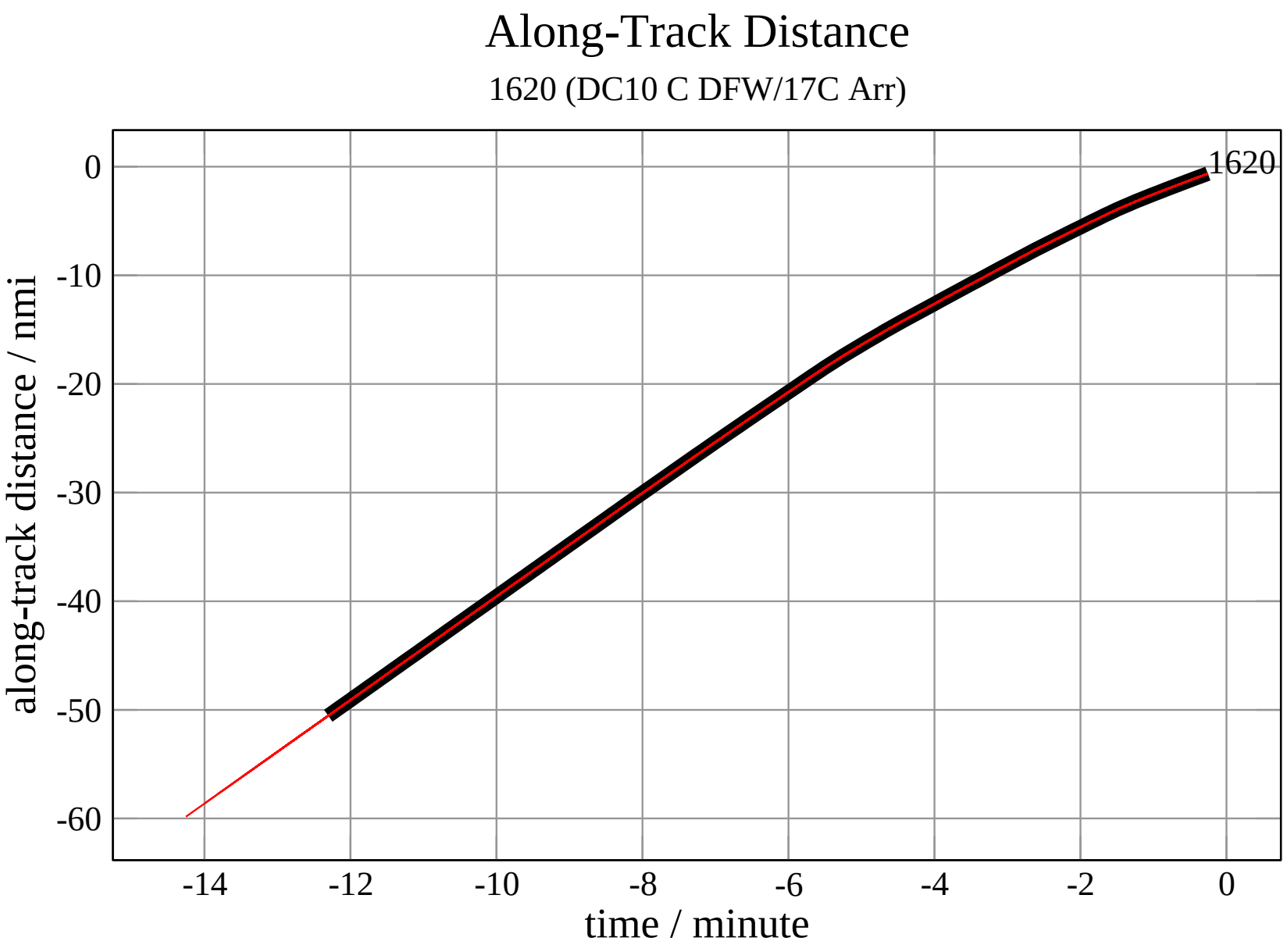

Along-Track Distance
1512 (BE20 F DFW/18R Arr)
1512
0
-10
-20
-30
-40
-50
-60
along-track distance / nmi
-18
-16
-14
-12
-10
-8
-6
-4
-2
0
time / minute

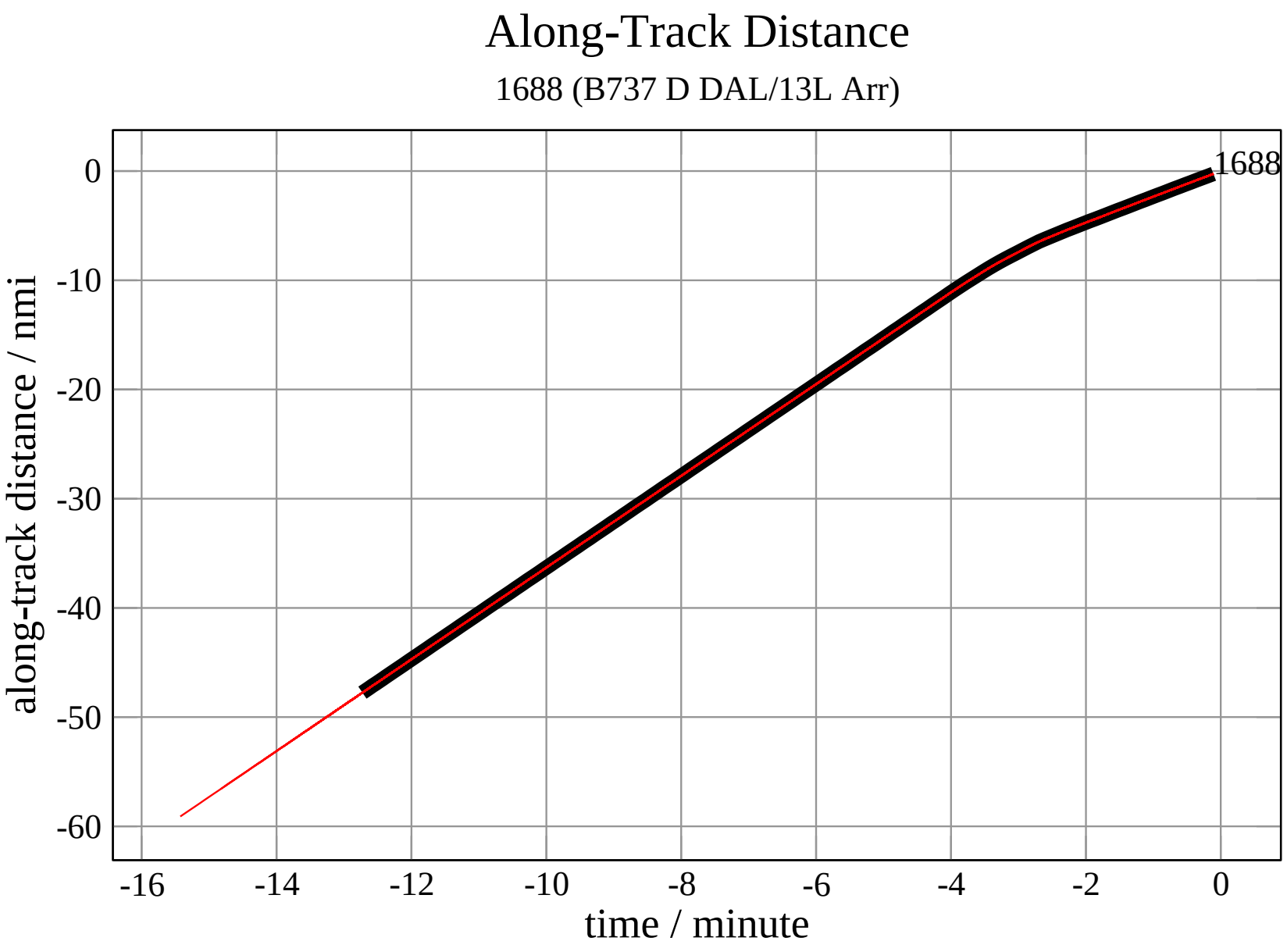

Along-Track Distance
1514 (B737 D DAL/13L Arr)
1514
0
-10
-20
-30
-40
-50
-60
-70
along-track distance / nmi
-20
-15
-10
-5
0
time / minute

Along-Track Distance

1558 (B733 D DAL/13L Arr)

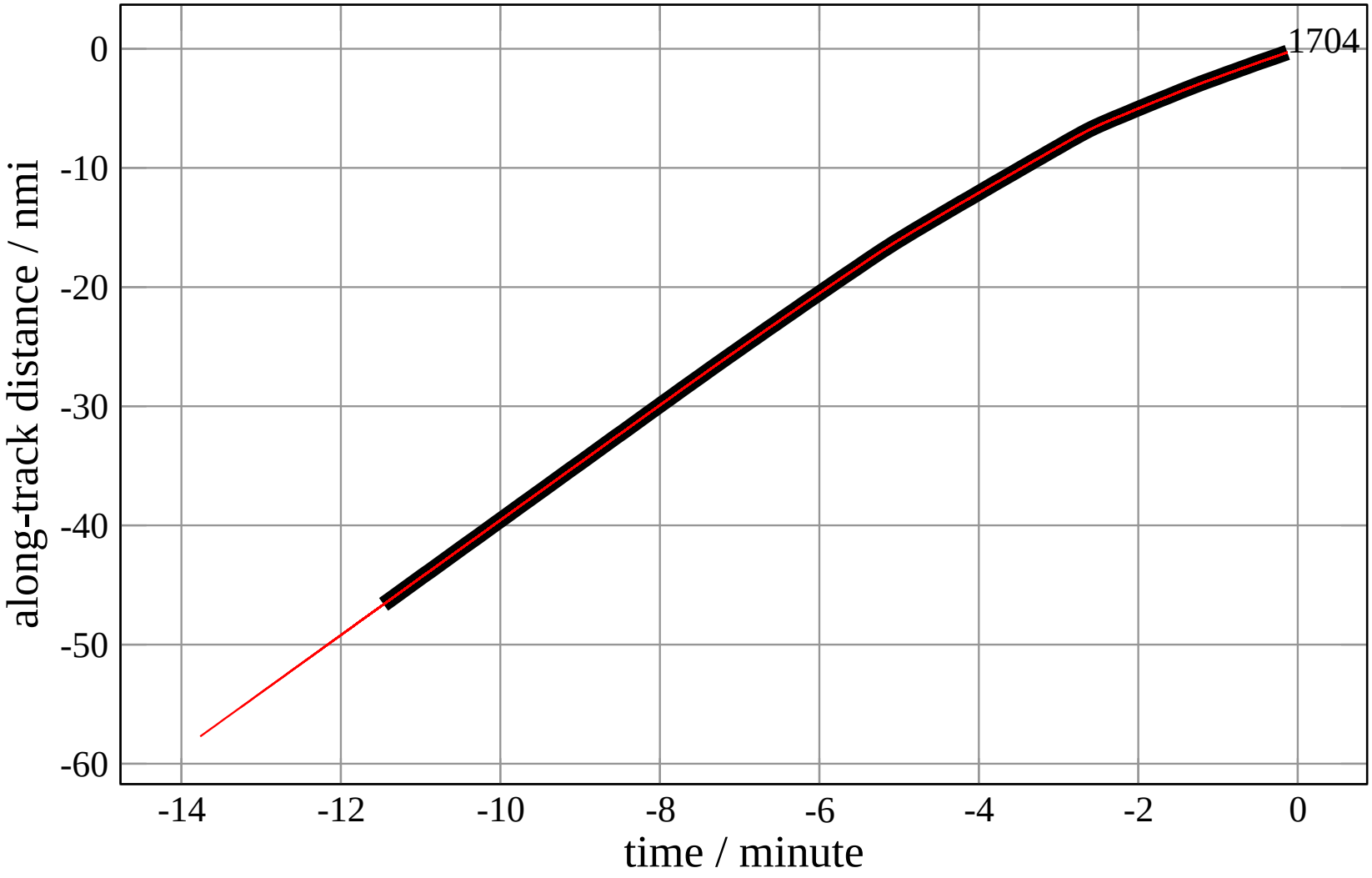


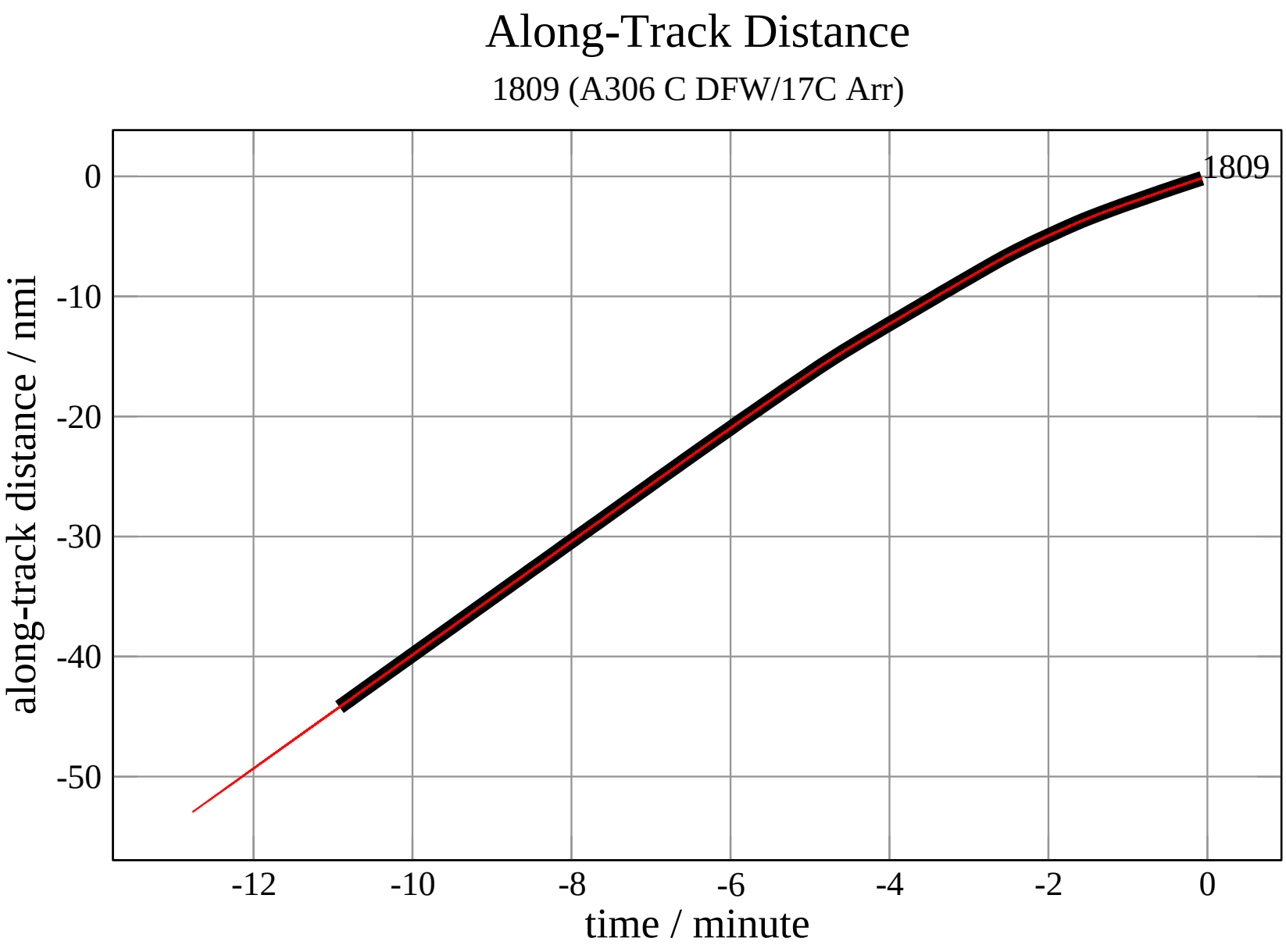

Along-Track Distance
1620 (DC10 C DFW/17C Arr)
1620
0
-10
-20
-30
-40
-50
-60
along-track distance / nmi
-14
-12
-10
-8
-6
-4
-2
0
time / minute

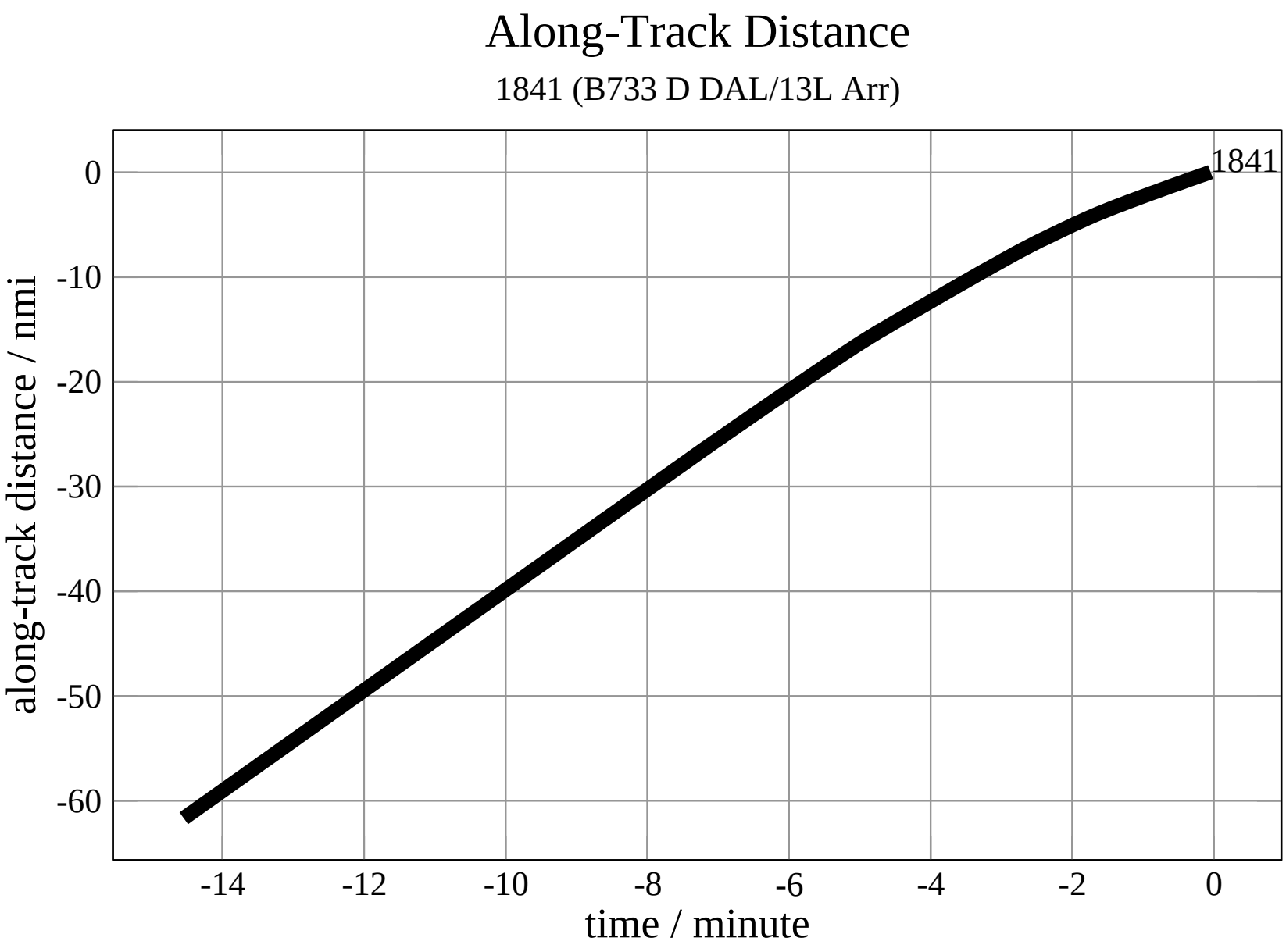

Along-Track Distance
1688 (B737 D DAL/13L Arr)
1688
0
-10
-20
-30
-40
-50
-60
along-track distance / nmi
-16
-14
-12
-10
-8
-6
-4
-2
0
time / minute

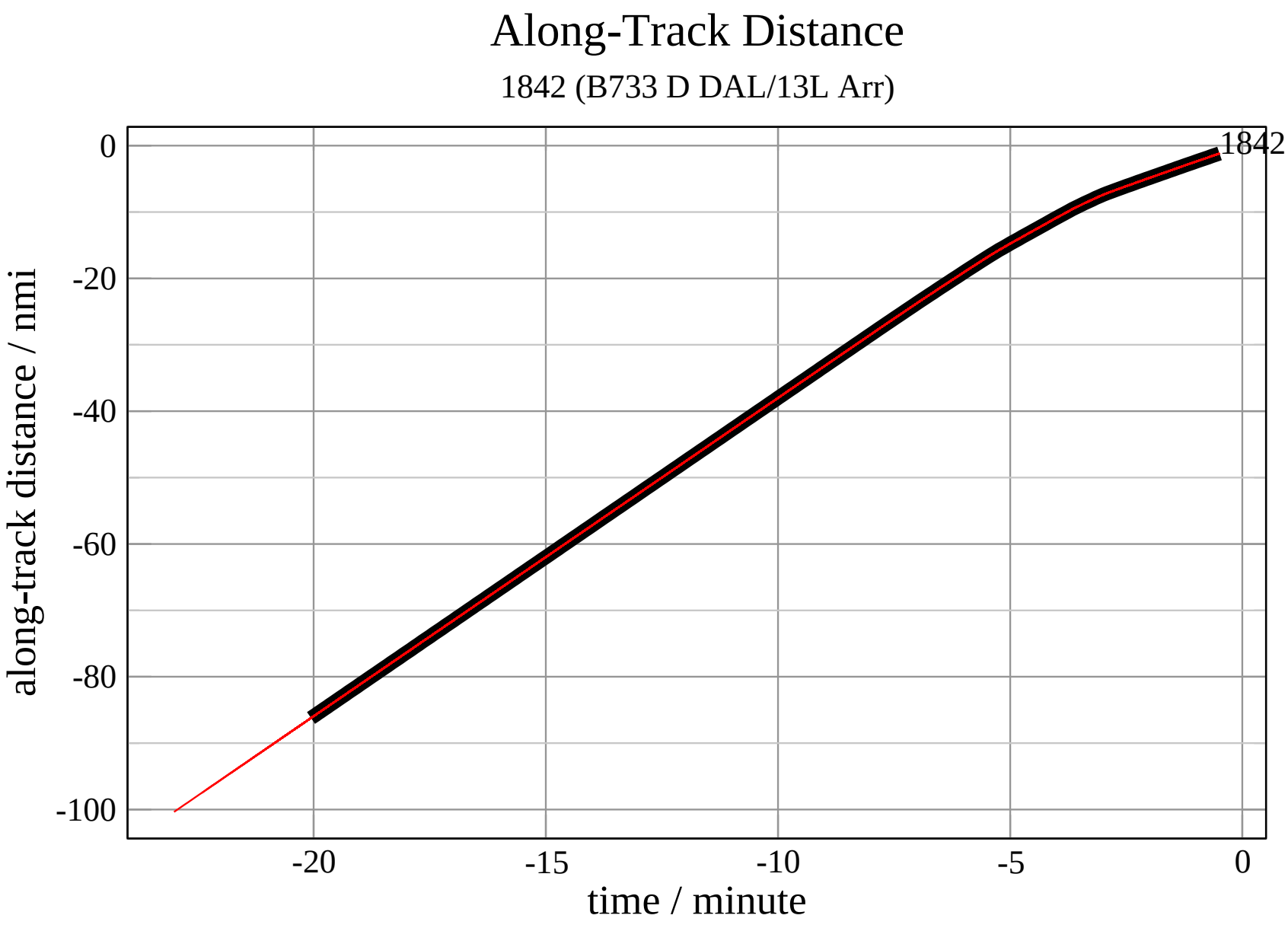
Along-Track Distance

1704 (B737 D DAL/13L Arr)



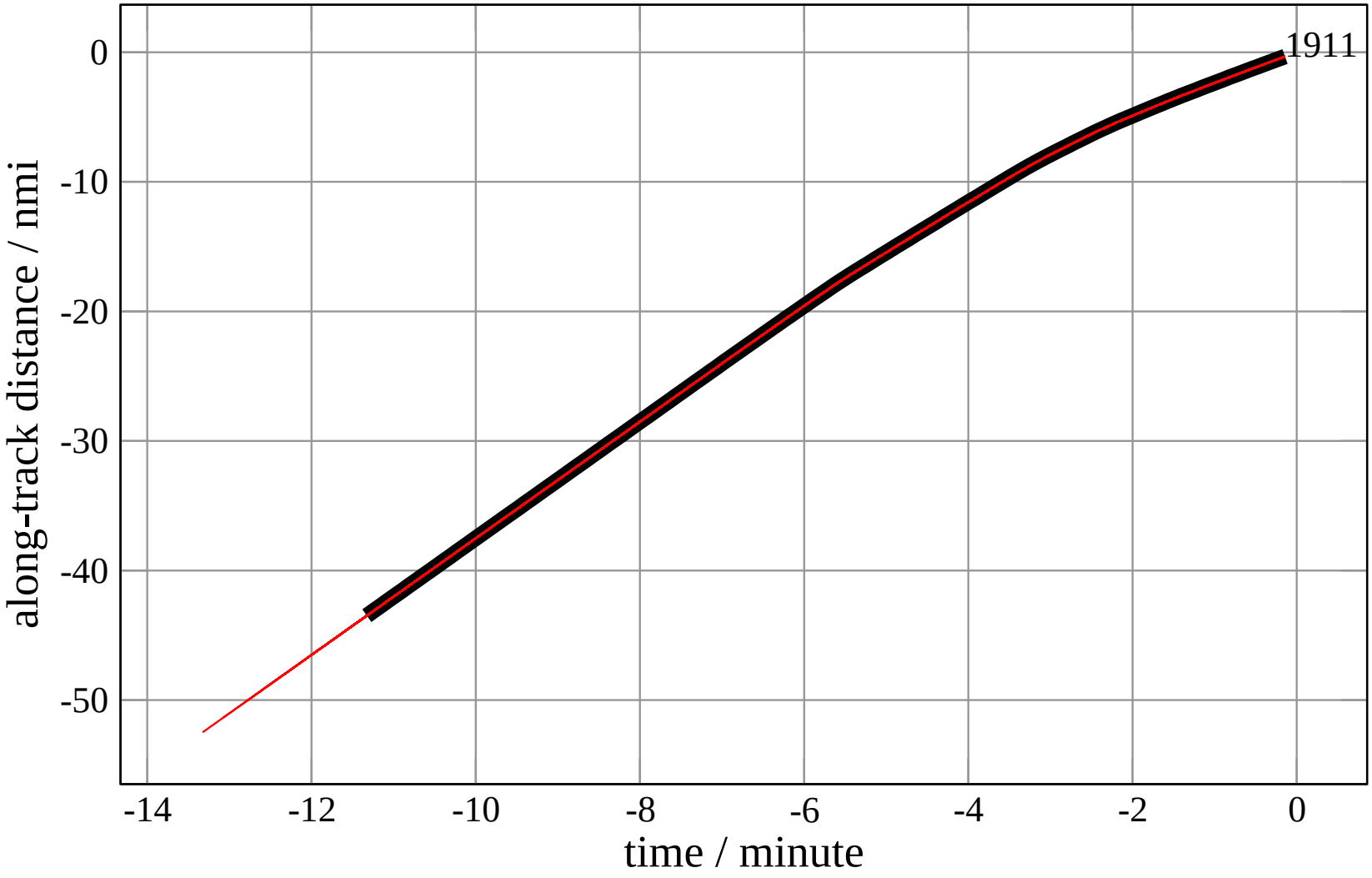

Along-Track Distance
1809 (A306 C DFW/17C Arr)
1809
0
-10
-20
-30
-40
-50
along-track distance / nmi
-12
-10
-8
-6
-4
-2
0
time / minute

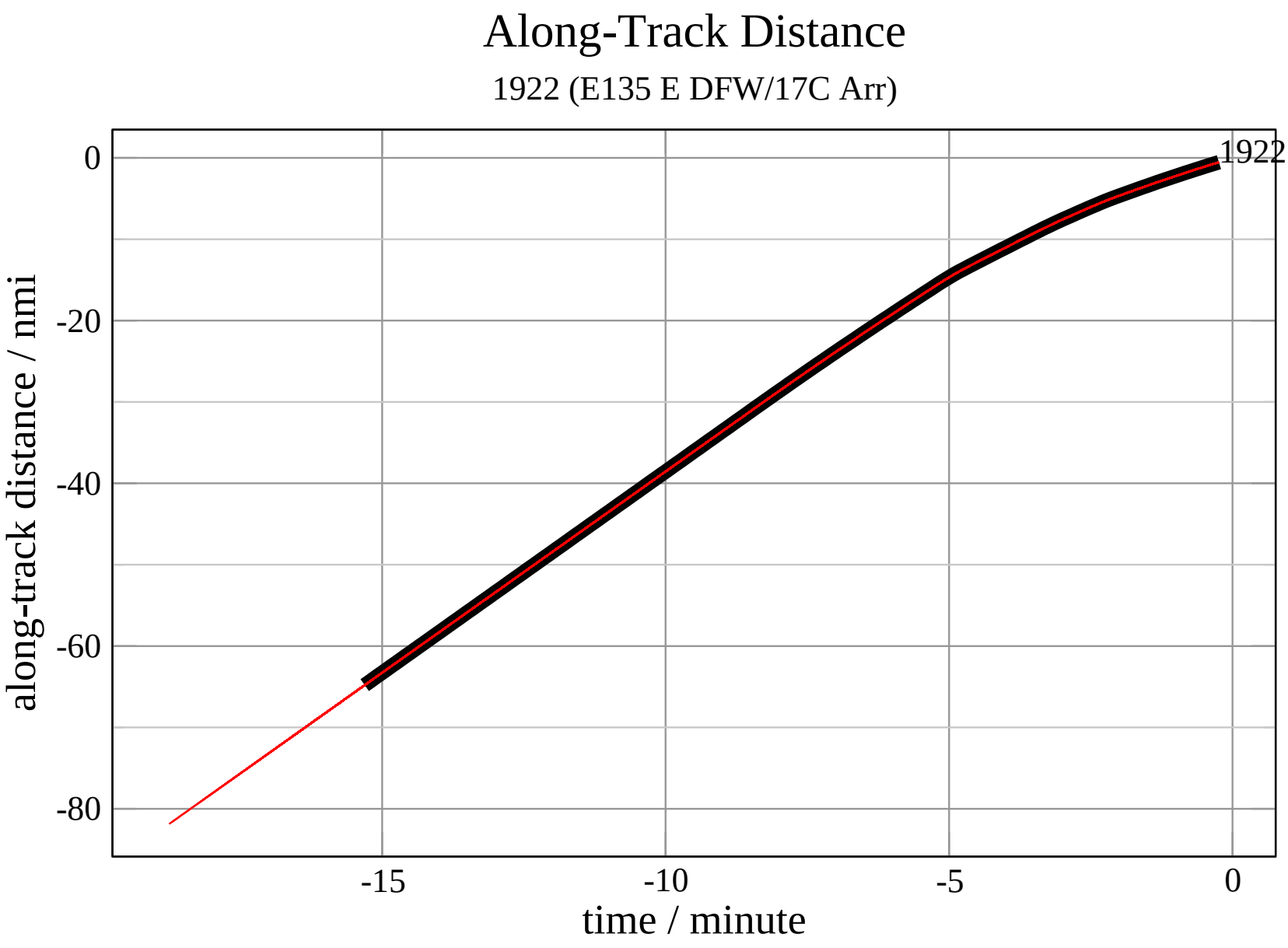

Along-Track Distance
1841 (B733 D DAL/13L Arr)
1841
0
-10
-20
-30
-40
-50
-60
along-track distance / nmi
-14
-12
-10
-8
-6
-4
-2
0
time / minute

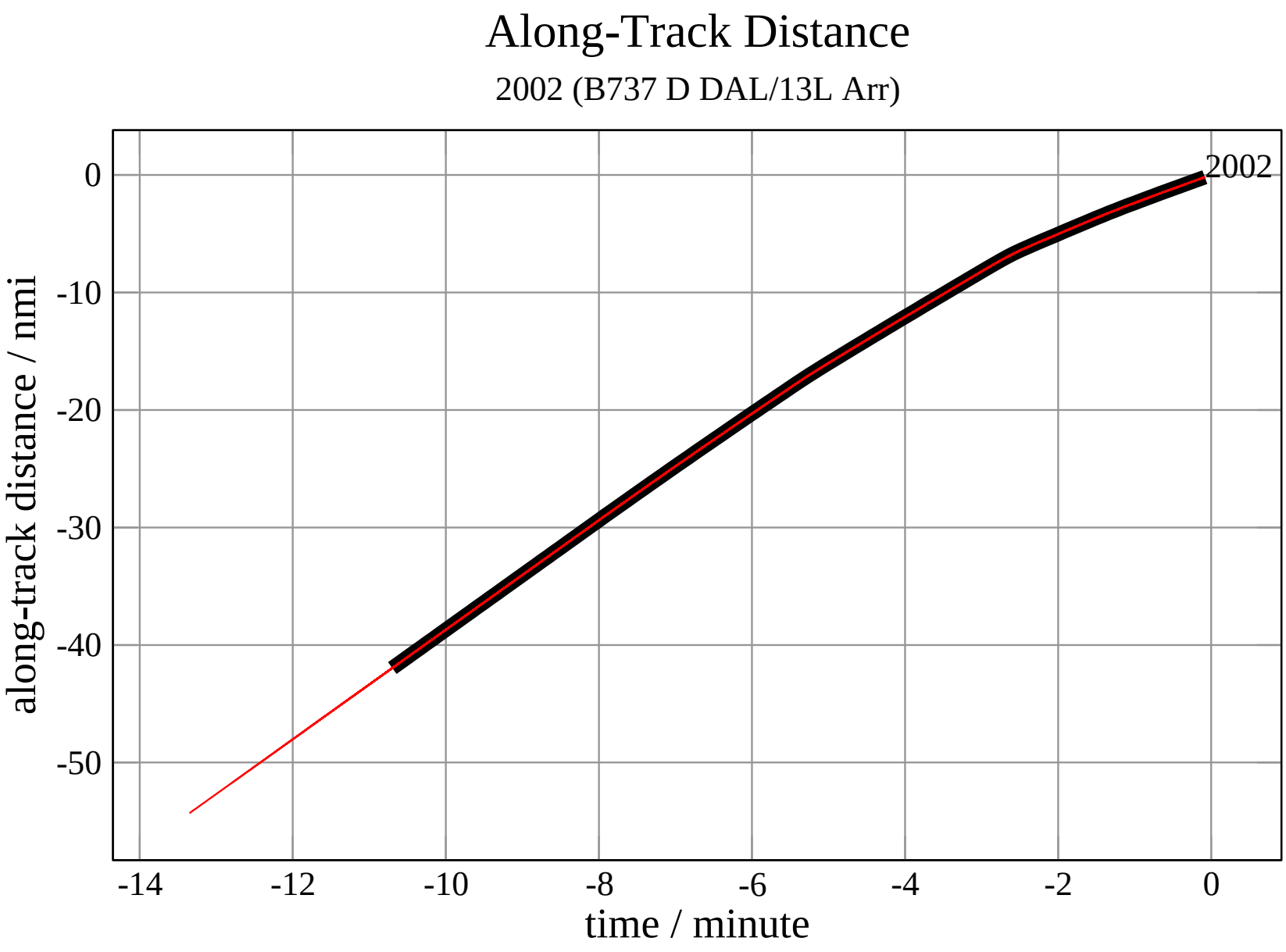

Along-Track Distance
1842 (B733 D DAL/13L Arr)
1842
0
-20
-40
-60
-80
-100
along-track distance / nmi
-20
-15
-10
-5
0
time / minute

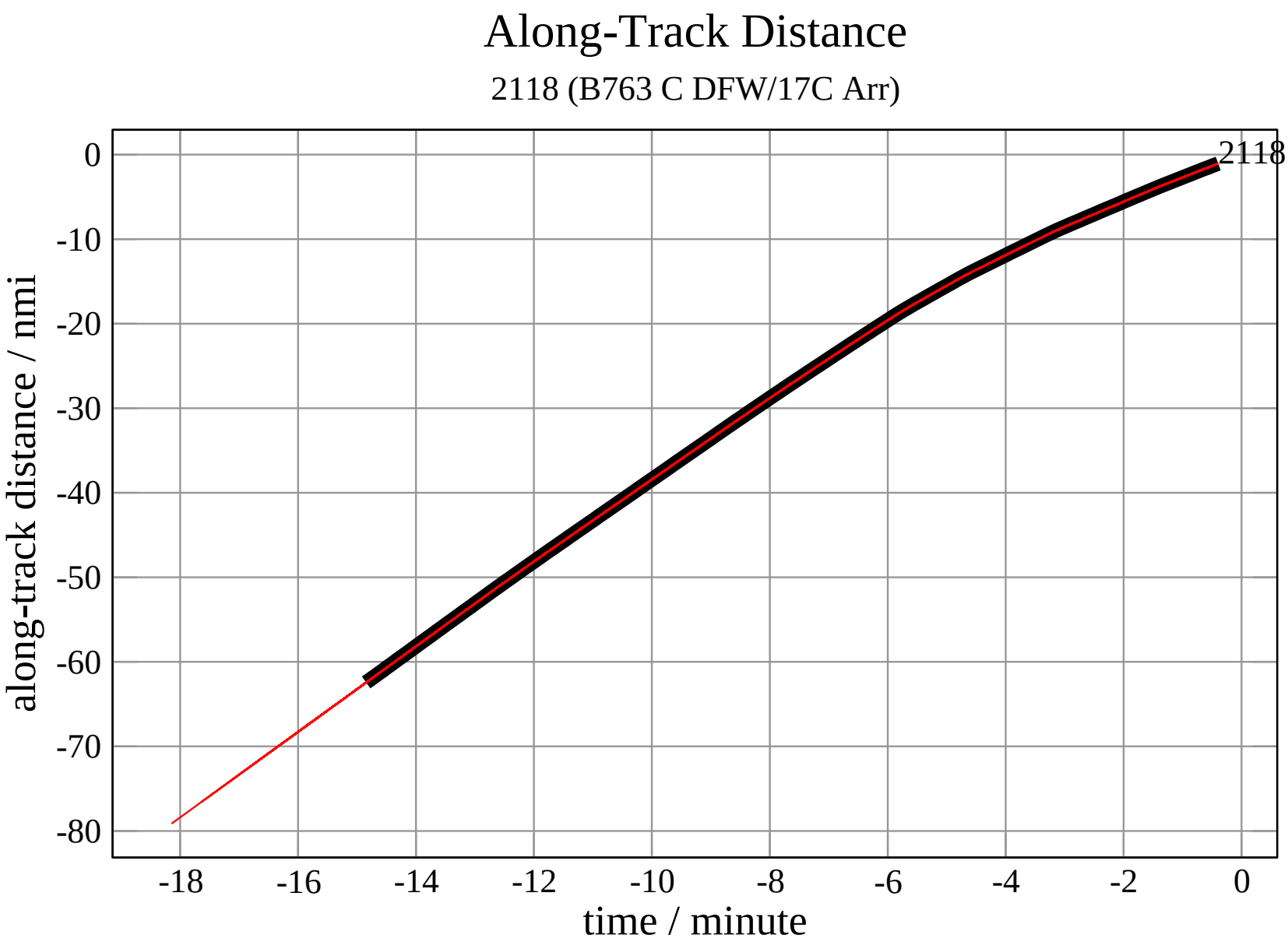
Along-Track Distance

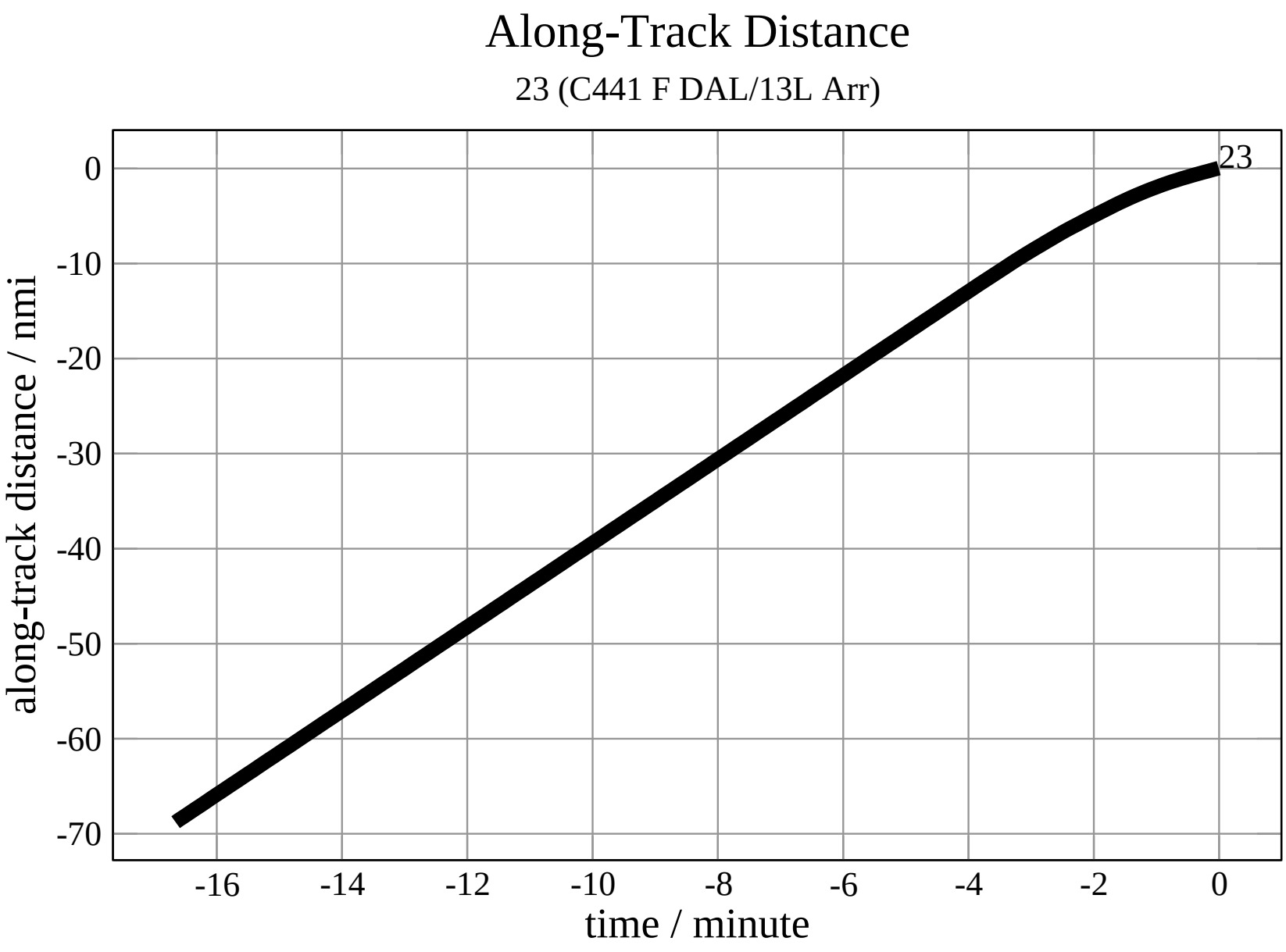
1911 (E145 E DFW/18R Arr)




Along-Track Distance
1922 (E135 E DFW/17C Arr)
1922
0
-20
-40
-60
-80
along-track distance / nmi
-15
-10
-5
0
time / minute

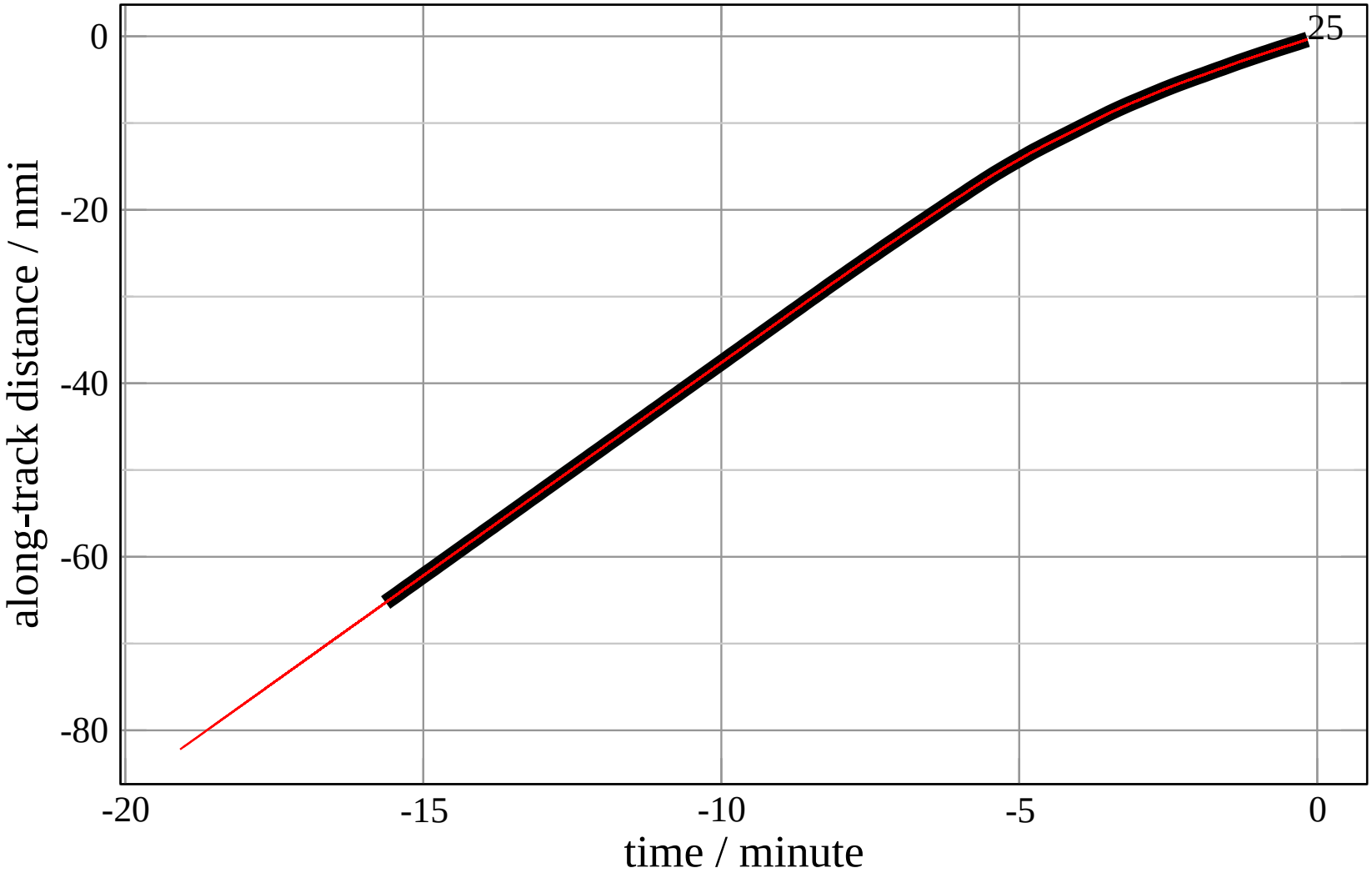

Along-Track Distance
2002 (B737 D DAL/13L Arr)
2002
0
-10
-20
-30
-40
-50
along-track distance / nmi
-14
-12
-10
-8
-6
-4
-2
0
time / minute

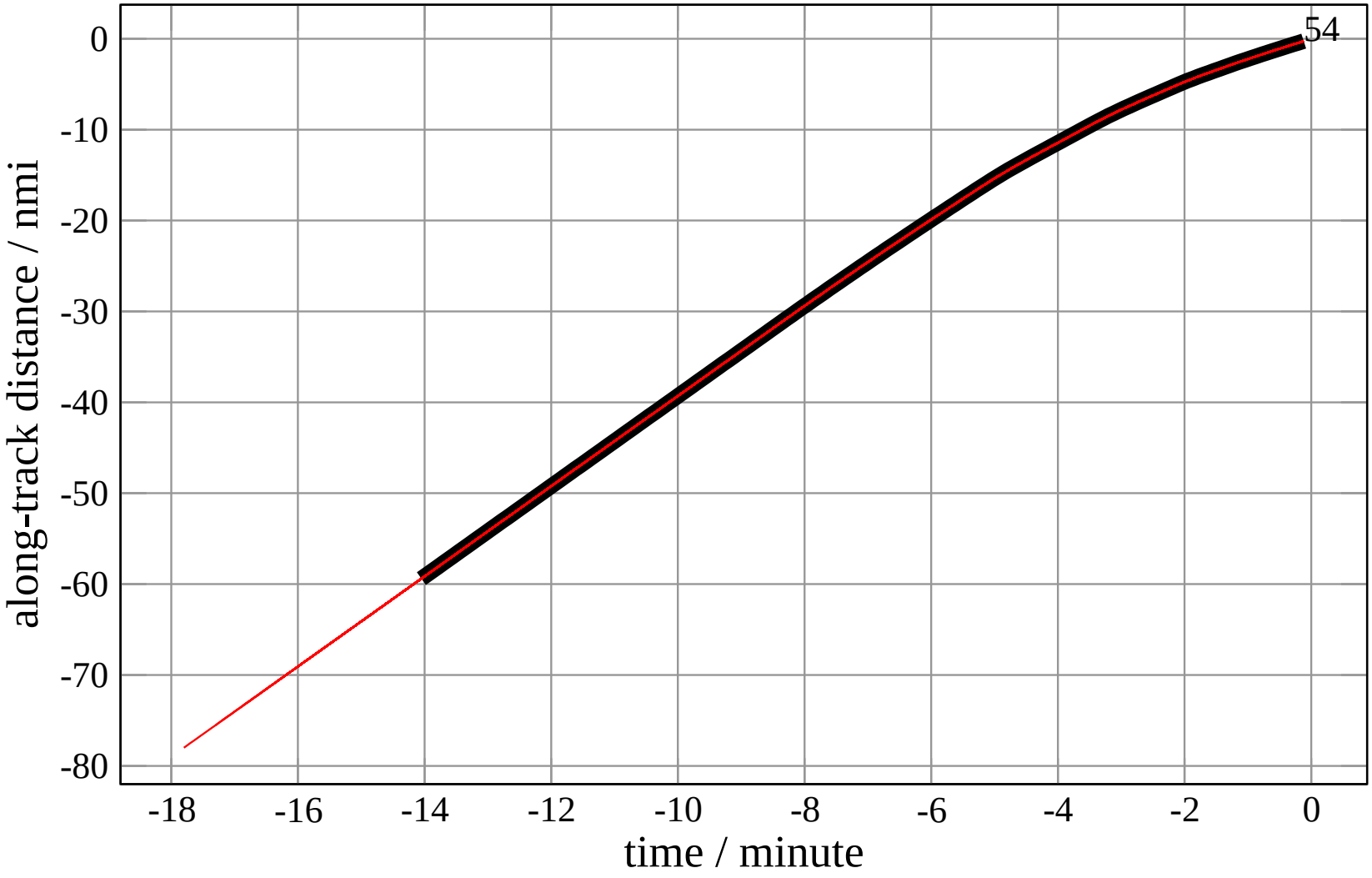

Along-Track Distance
2118 (B763 C DFW/17C Arr)
2118
0
-10
-20
-30
-40
-50
-60
-70
-80
along-track distance / nmi
-18
-16
-14
-12
-10
-8
-6
-4
-2
0
time / minute


Along-Track Distance
23 (C441 F DAL/13L Arr)
23
0
-10
-20
-30
-40
-50
-60
-70
along-track distance / nmi
-16
-14
-12
-10
-8
-6
-4
-2
0
time / minute

Along-Track Distance

25 (E135 E DFW/18R Arr)



Along-Track Distance

54 (E135 E DFW/17C Arr)