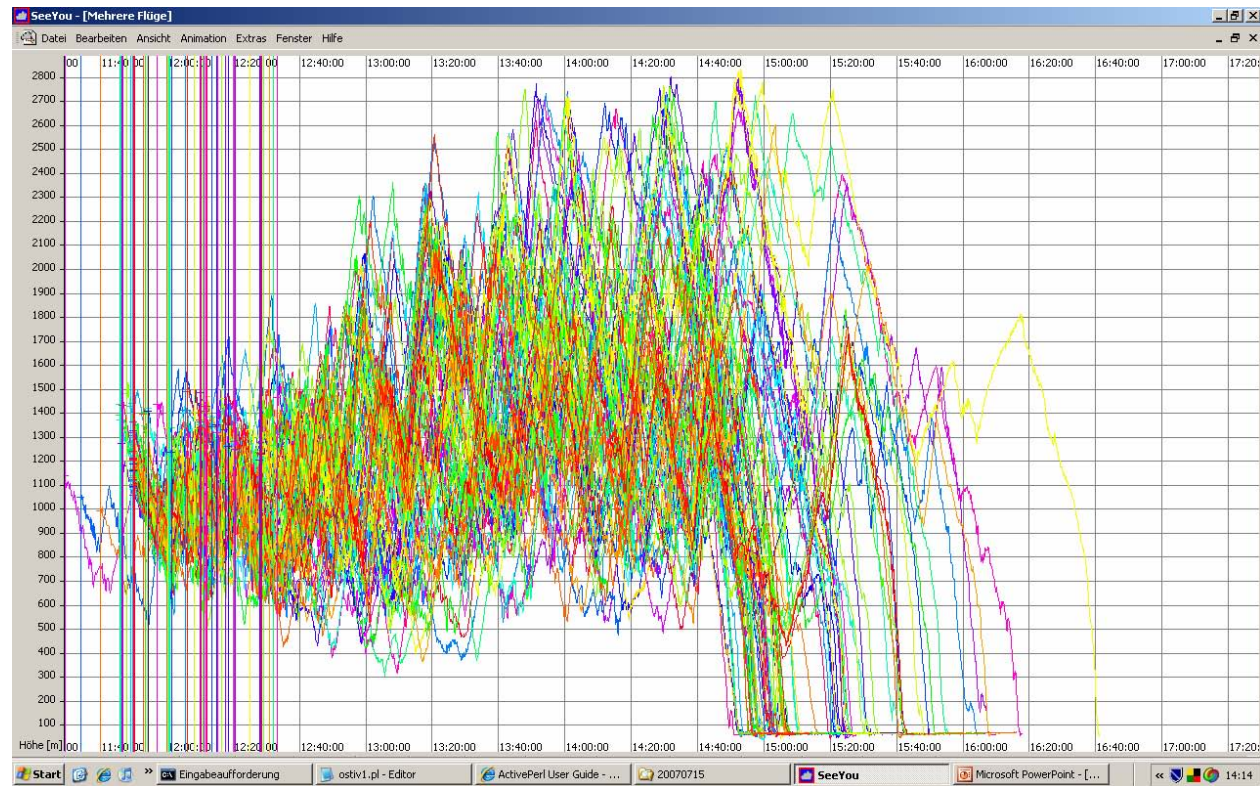


How complex is real soaring? A statistical IGC file analysis



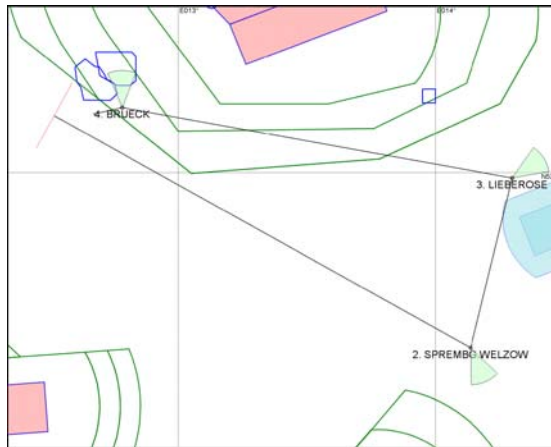
studied case

- Lilienthal Glide 2007 (German Nationals), Lüsse
- day 1, 15.7.: 96 completed flights, 96 IGC files, no outlandings

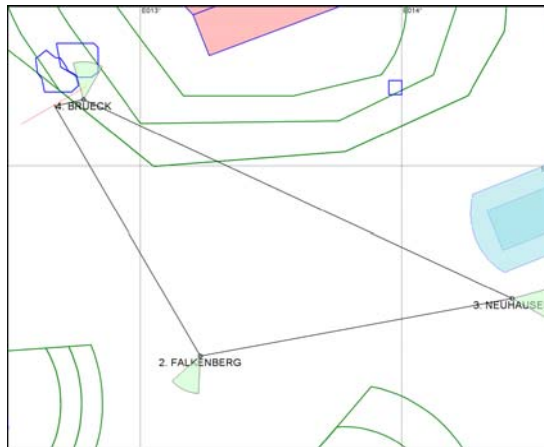
desired objects

- height and vertical speed distributions
- with spatial and temporal resolution

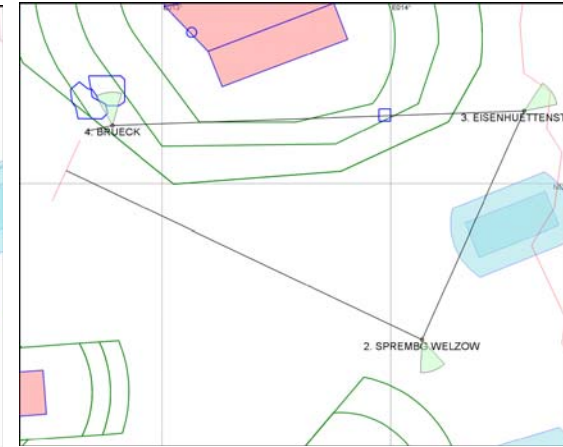
15m: 292 km AST

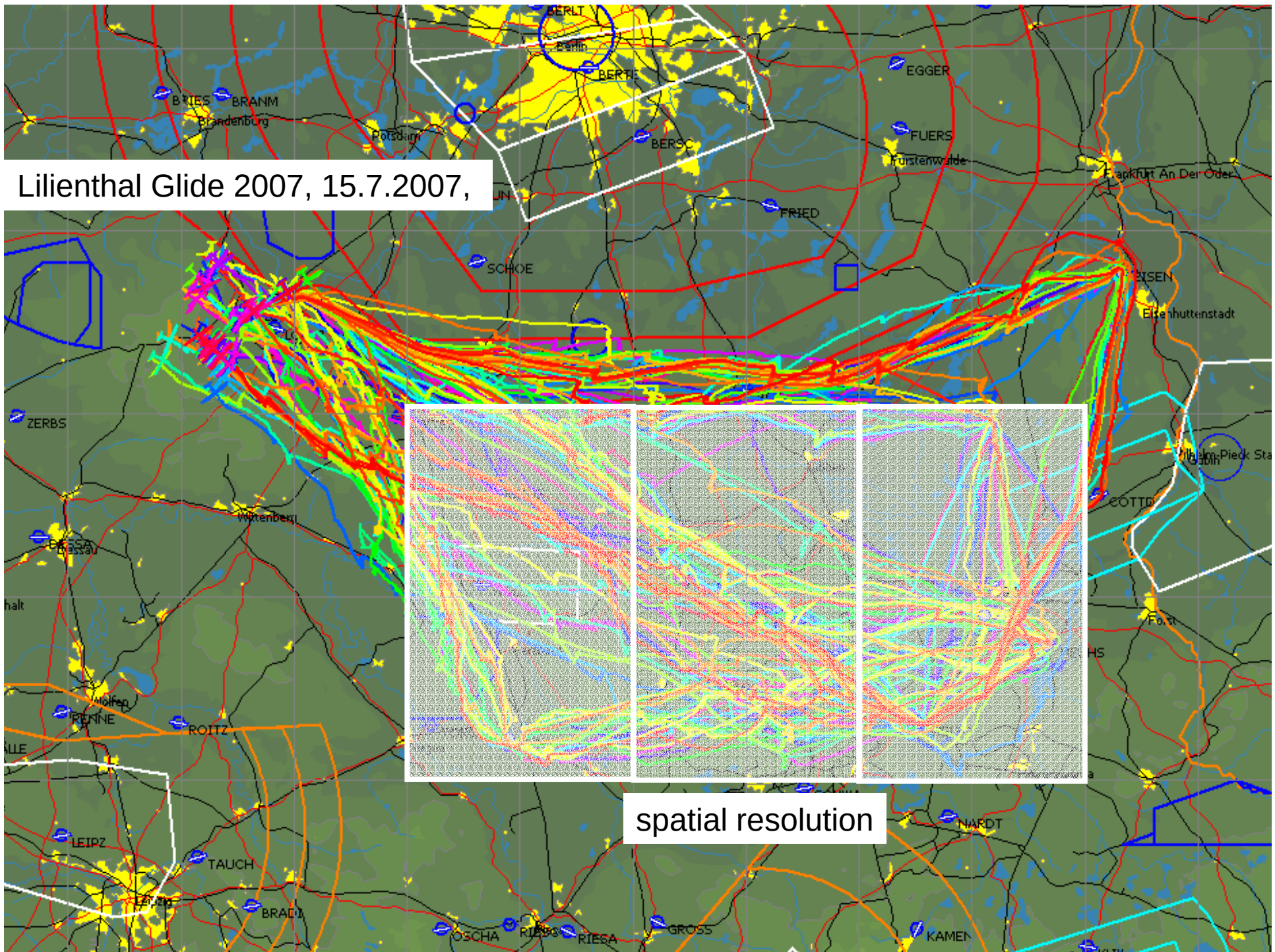


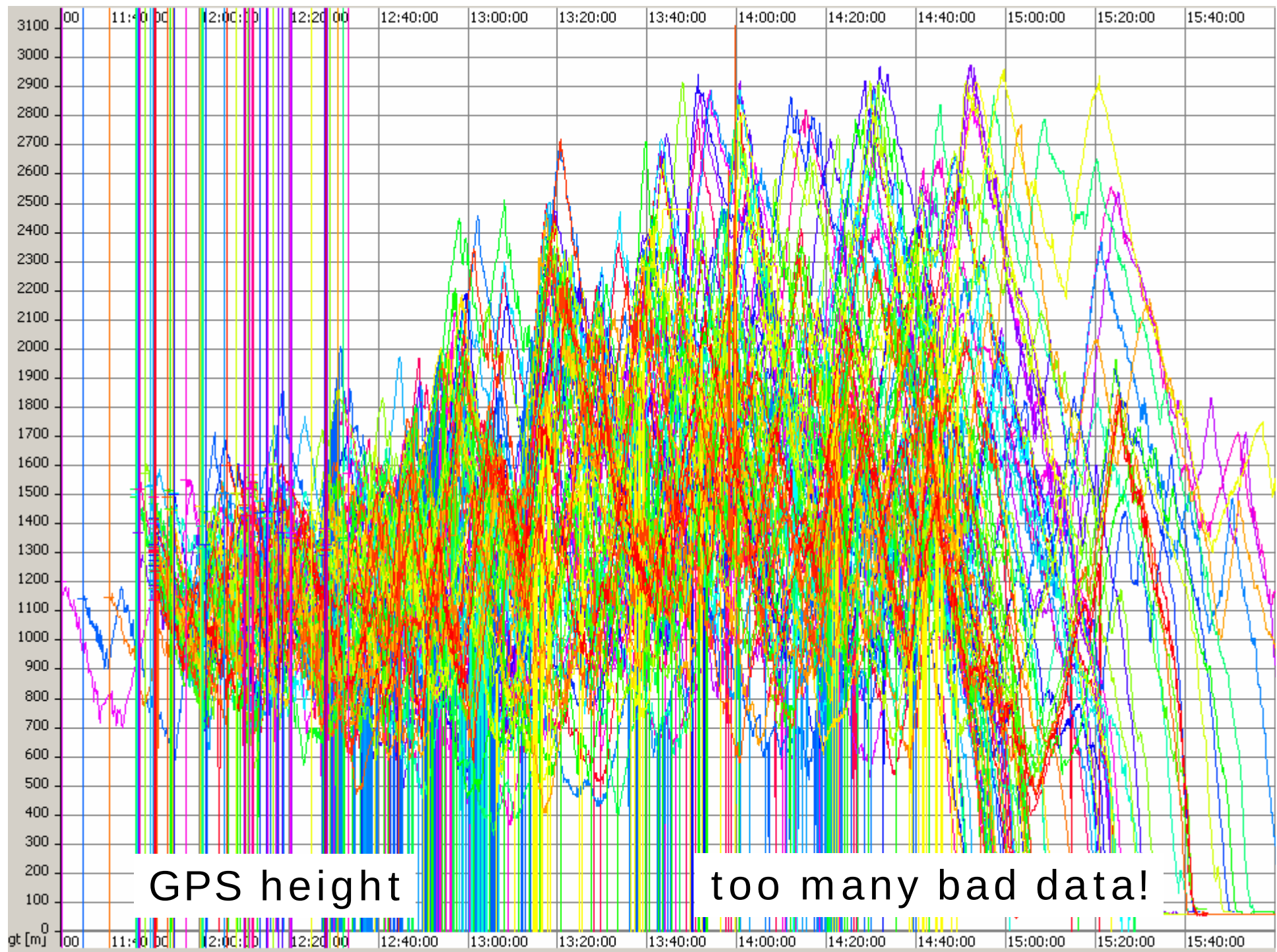
18m: 288 km AST

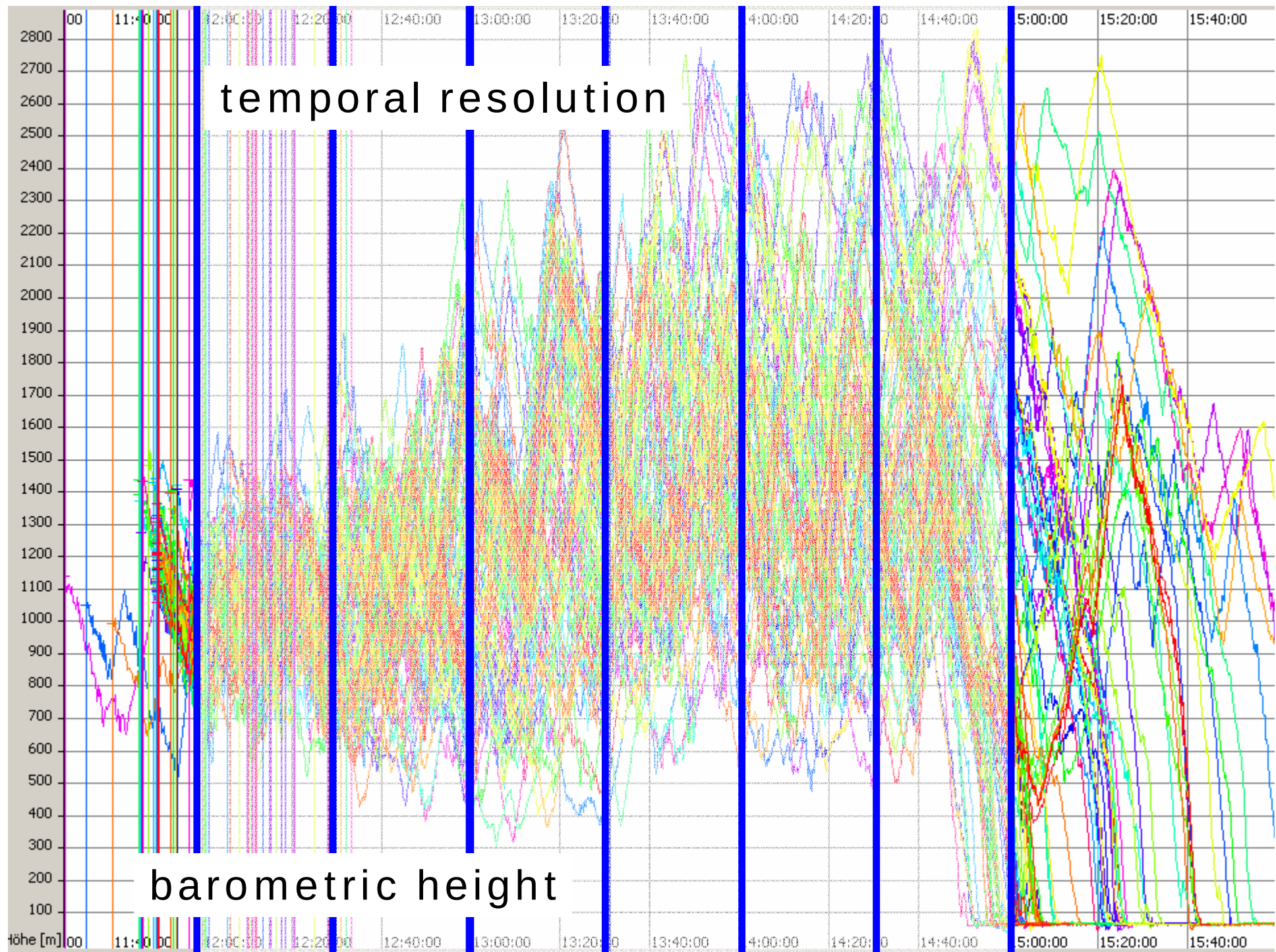


Open: 325 km AST









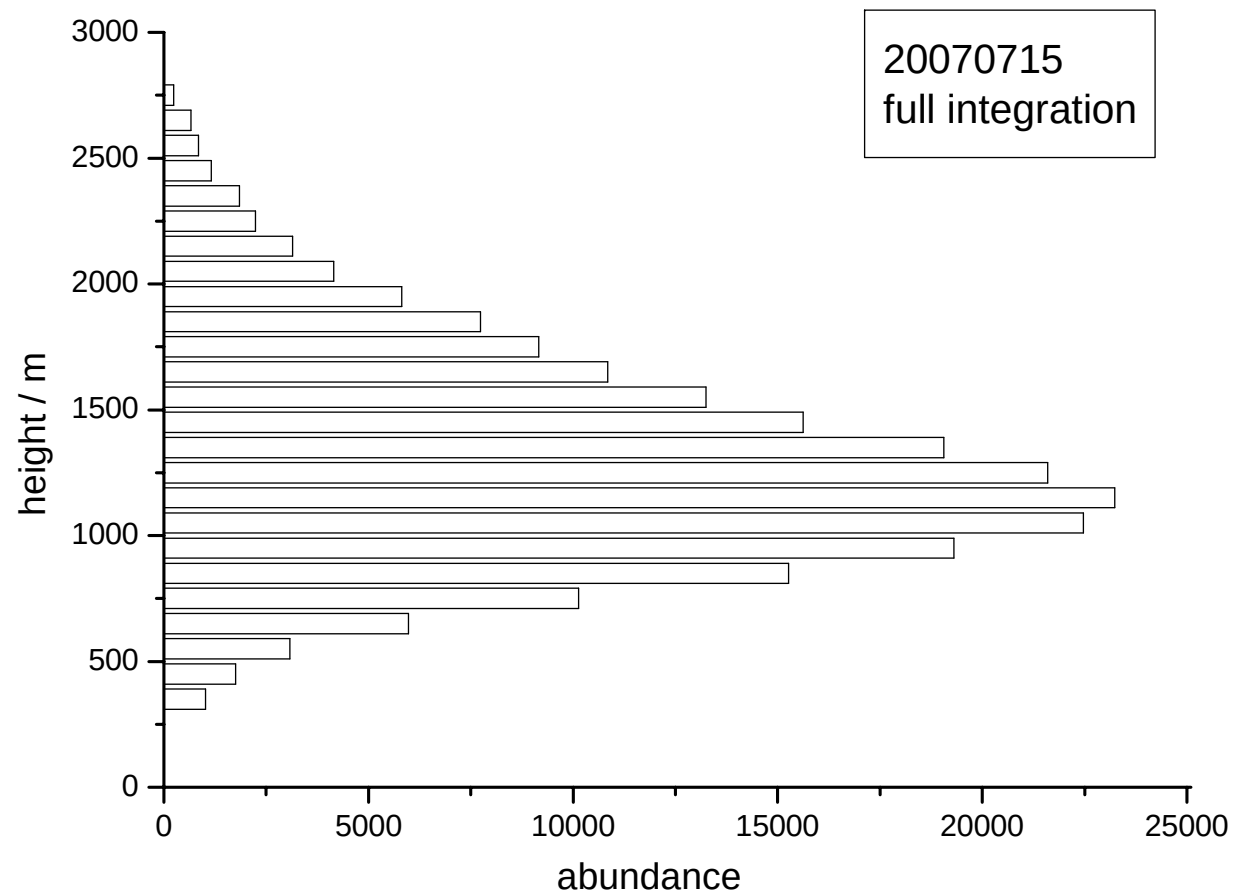
3 space "squares": W: 51N30 – 52N00 13E00 – 13E30
 C: 51N30 – 52N00 13E30 – 14E00
 E: 51N30 – 52N00 14E00 – 14E30

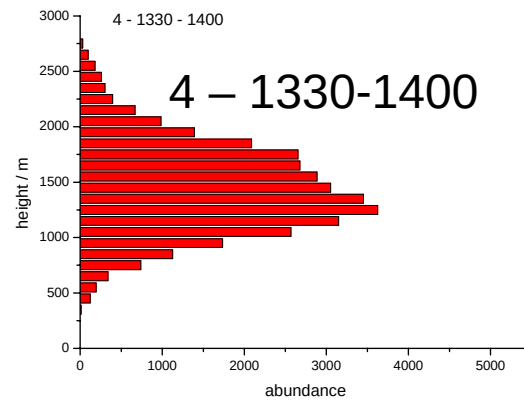
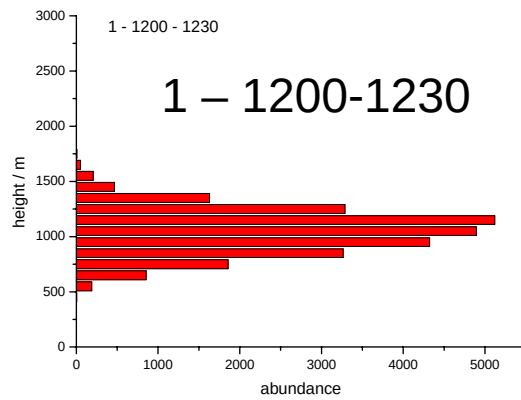
6 time bins: 1: 1200 – 1230
 2: 1230 – 1300
 3: 1300 – 1330
 4: 1330 – 1400
 5: 1400 – 1430
 6: 1430 – 1500

18 space-time "cubes": W1 – W6, C1 – C6, E1 – E6

For each space time cube: Obtain height and vertical speed distribution

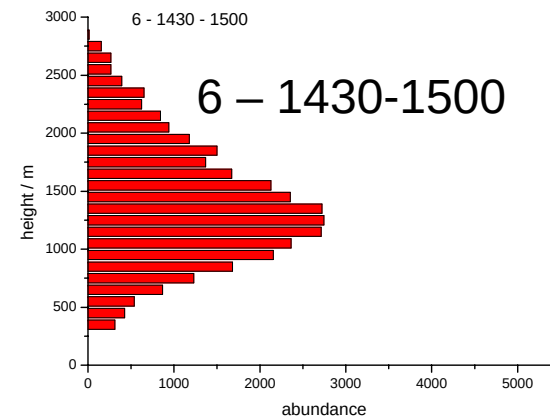
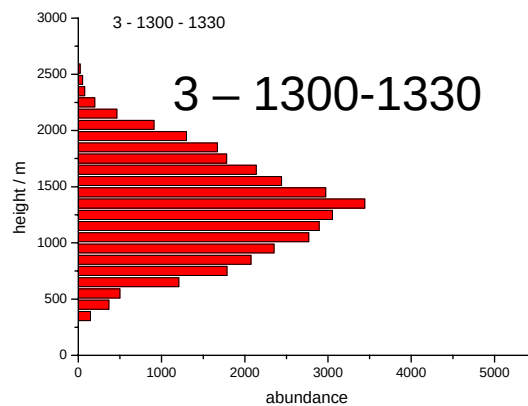
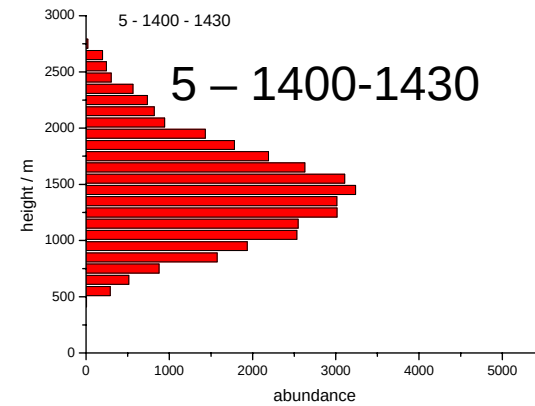
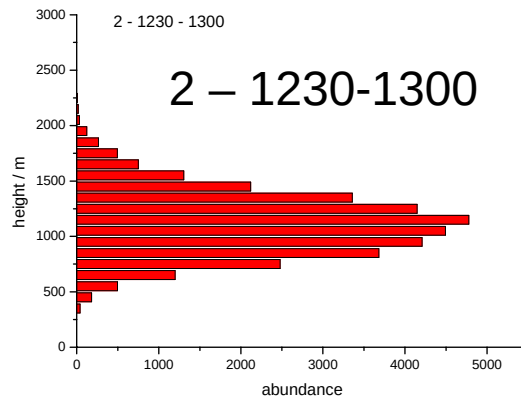
height distribution, integrated in time and space



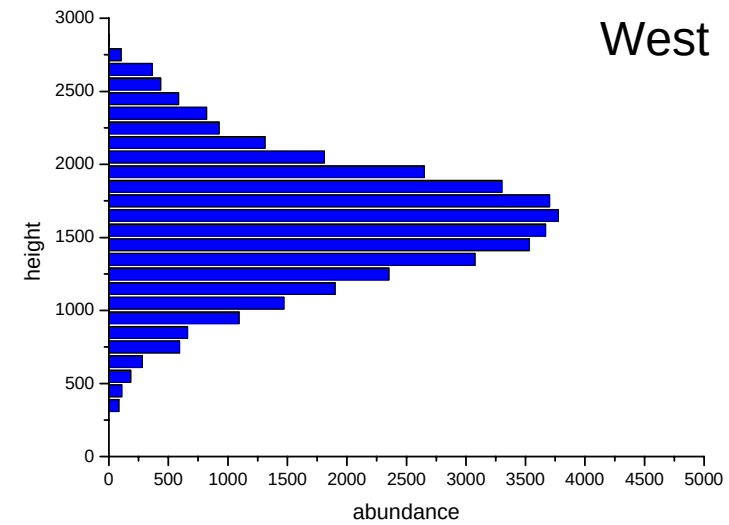
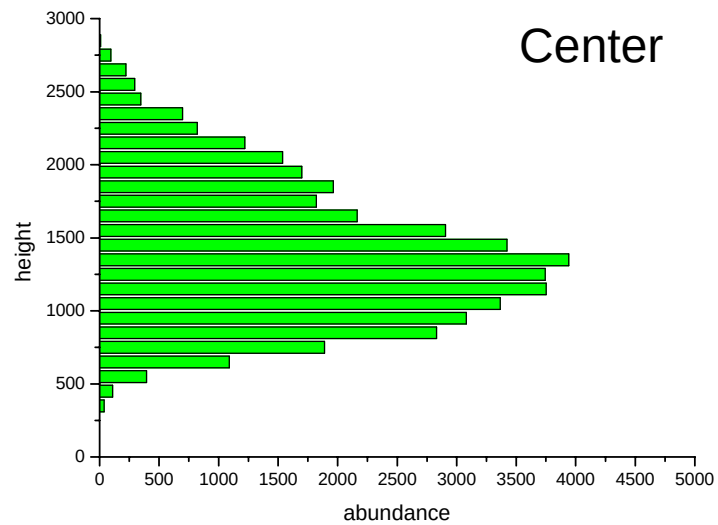
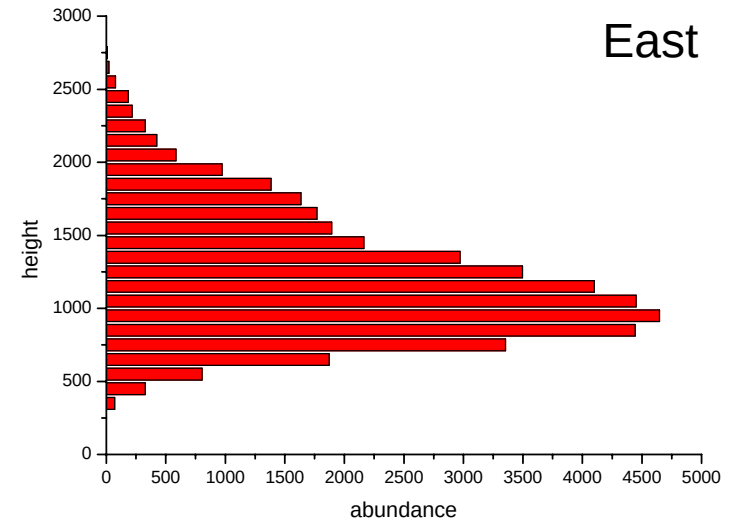
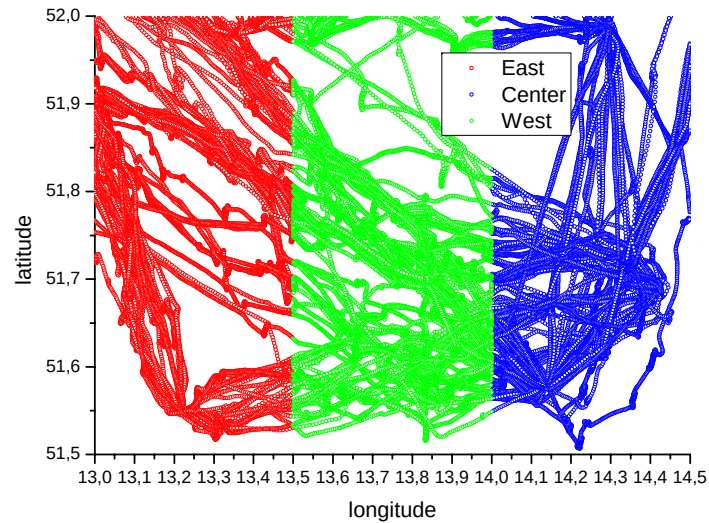


height distribution
temporally resolved
(30 minute intervals)

no space resolution



spatially resolved height distributions (no time distribution)



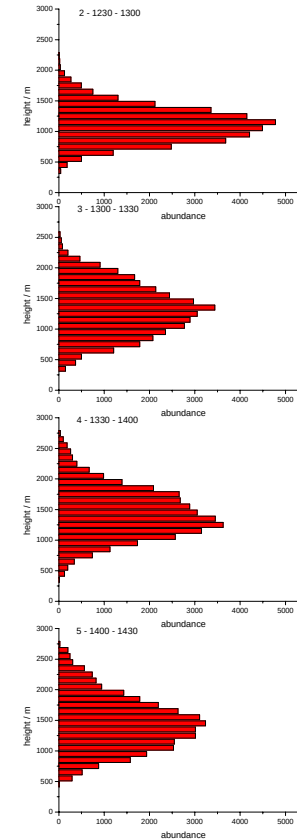
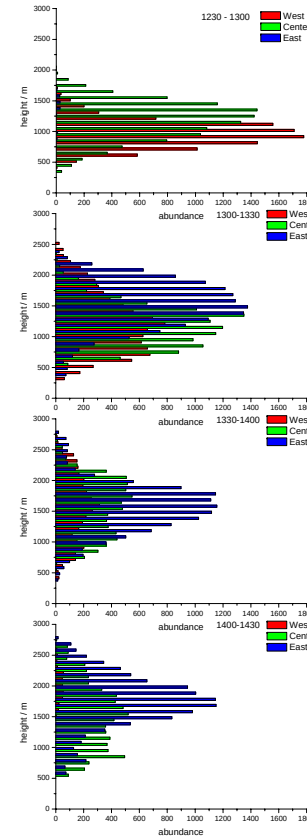
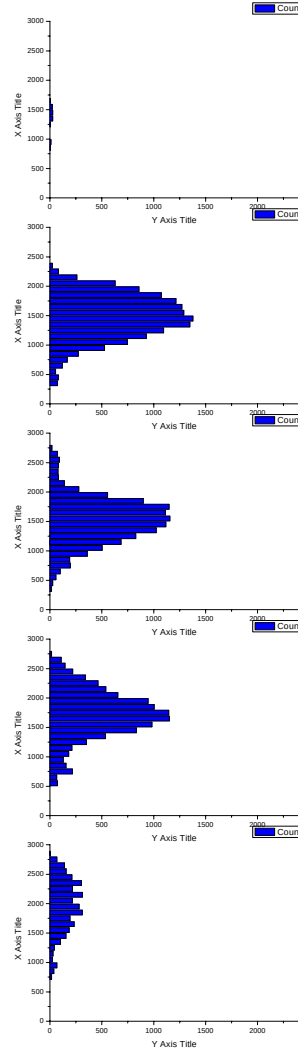
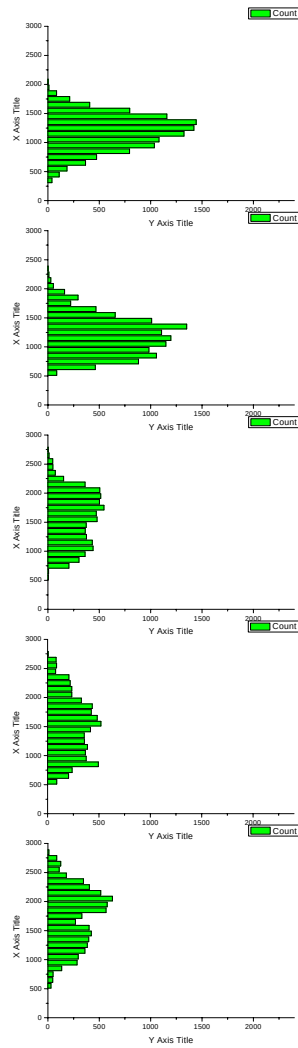
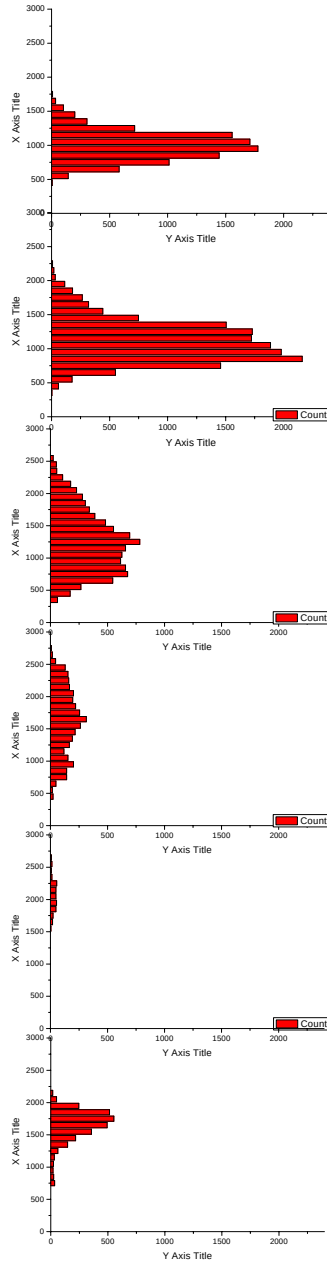
Height Distributions

time and space resolved

co-added

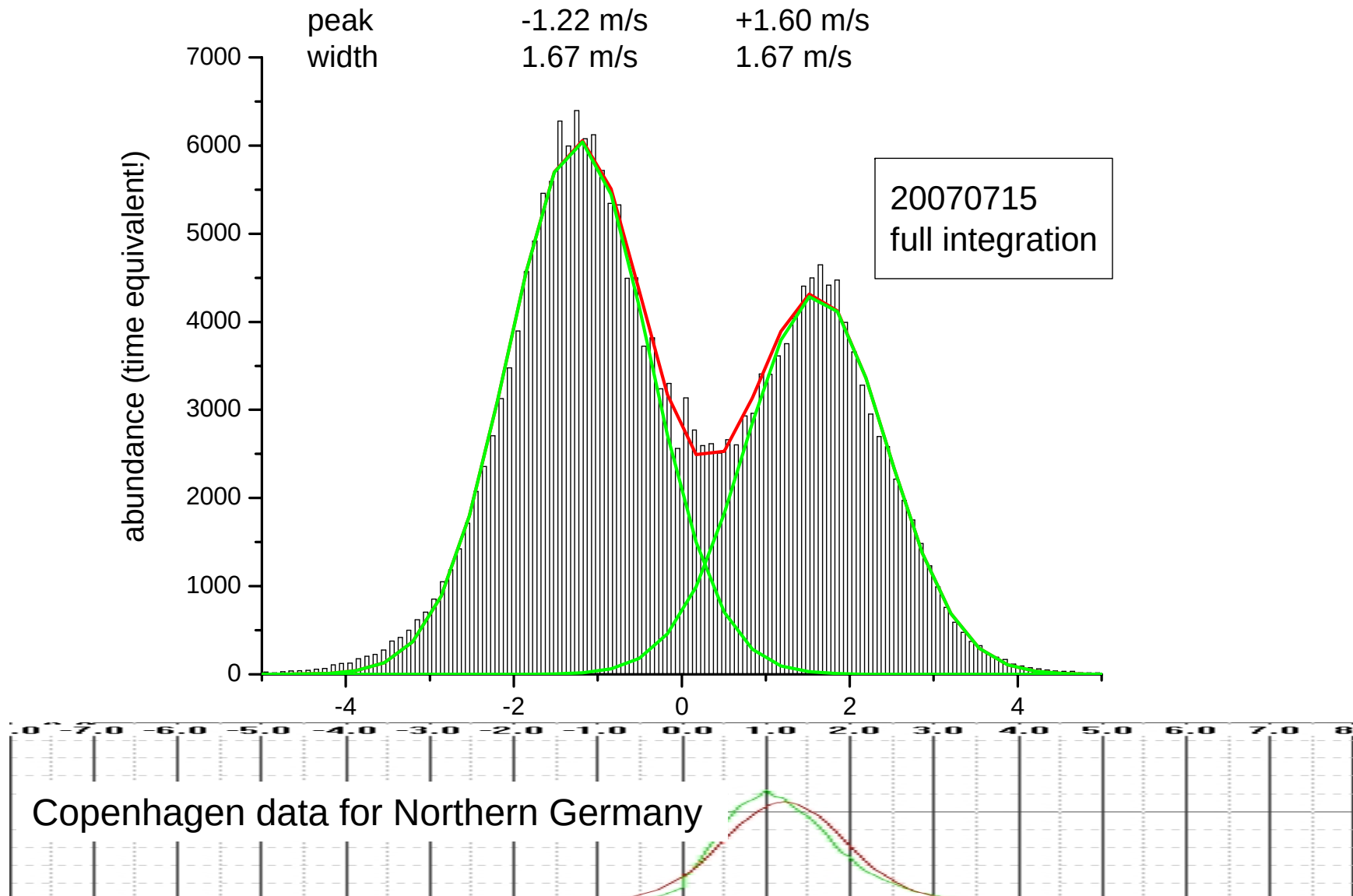
summed

time



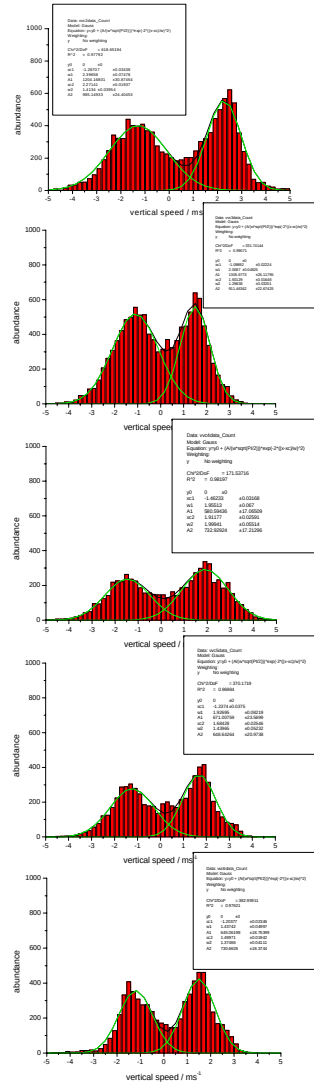
East

vertical speed distribution, integrated in time and space



vertical speed distribution with time and space resolution (double Gaussian fit)

peak center / width
(units: m/s)



central area, 1230 - 1300

-1.28 2.40
+2.27 1.41

central area, 1300 - 1330

-1.10 2.01
+1.50 1.30

central area, 1330 - 1400

-1.46 1.96
+1.91 2.00

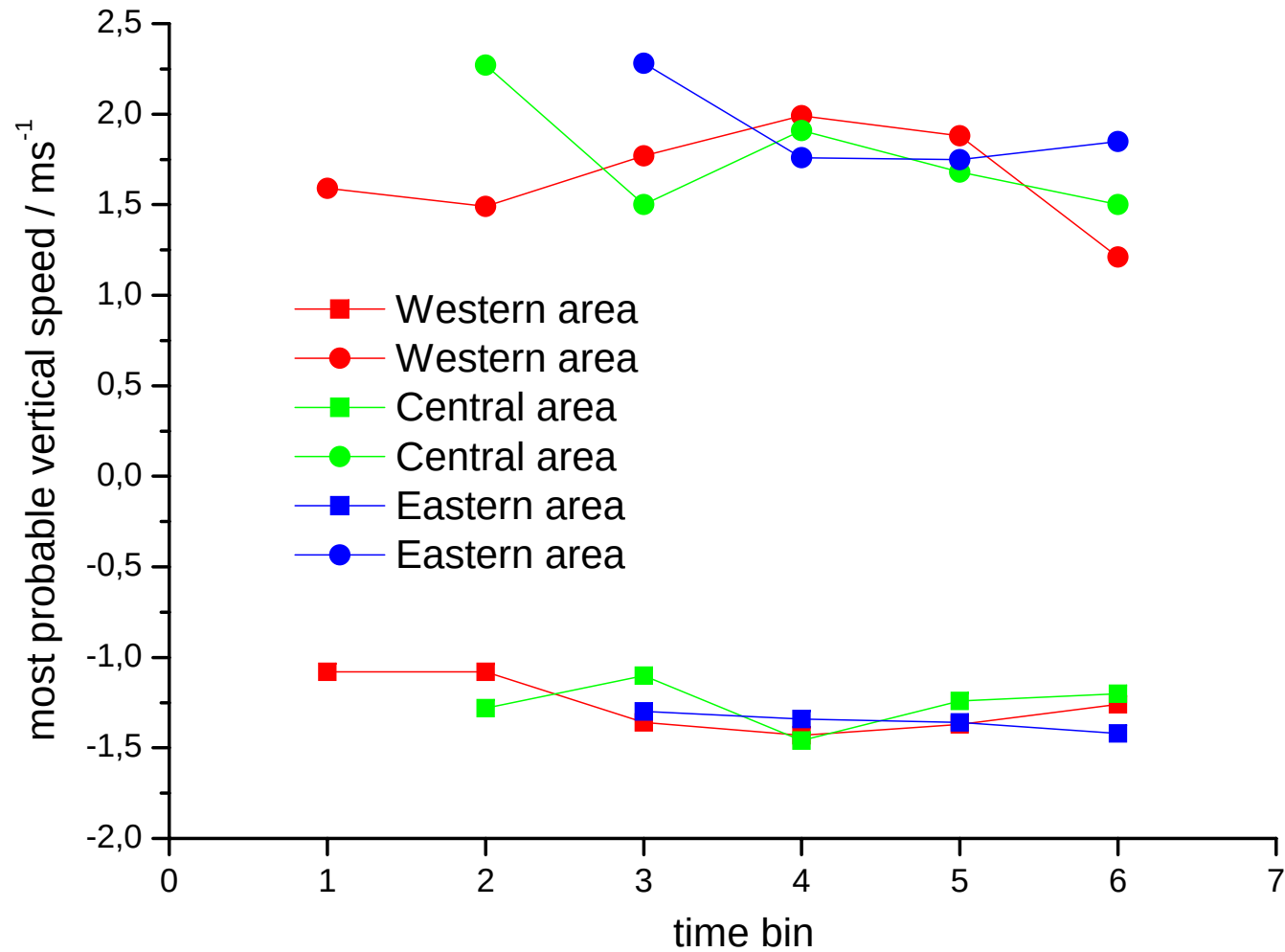
central area, 1400 - 1430

-1.24 1.93
+1.68 1.44

central area, 1430 - 1500

-1.20 1.44
+1.50 1.37

space-time-resolved vertical speed distributions centers of Gaussian distributions



Conclusion and questions

Space-time-resolved IGC file analysis can be done!

What does it tell us?

If we feel, it does not tell us much, why is this so?

badly chosen case, short flights in fully developed thermals, small task?

What should be changed, so it tells us more?

Is a distinction between thermalling and straight flight necessary or useful?

What types of flight should be analysed?

Competition flights yield good statistics, but cover only short times.

Individual long distance flights have good time coverage, but poor spatial statistics.

Analysis of a large number of XC flights (OLC) yields good statistics in every respect,
but includes a large number of inexperienced or leisure-oriented pilots.

A biased selection of OLC flights? What criteria to be used?

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