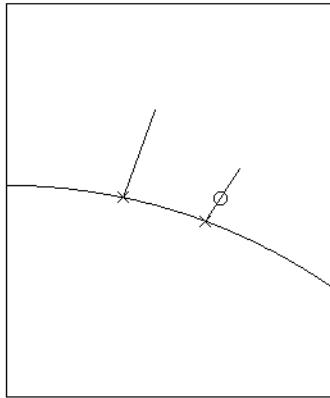
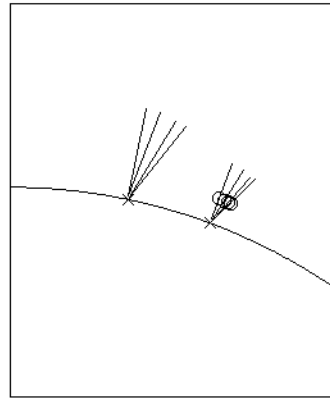


Common Programs

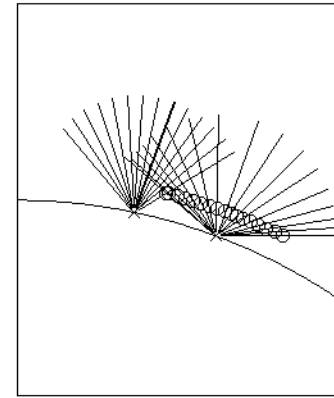
CP1



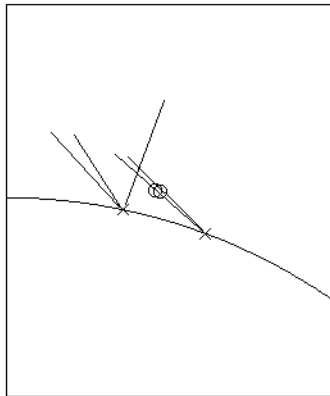
CP2



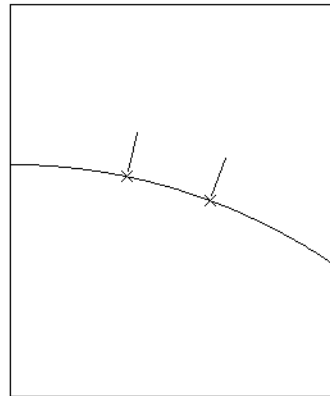
CP3



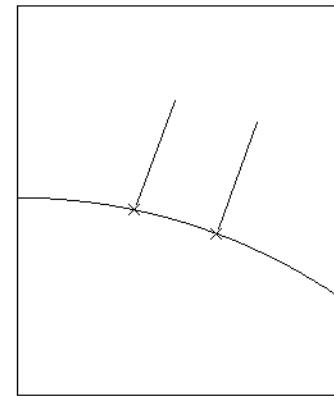
CP4



CP6



CP7



Experiments @ EISCAT

- Common Programs (CP)
 - 1000 (2000) hours/year
 - Run by EISCAT staff
 - Data 'belongs' to all associates
- Special Programs (SP)
 - 2000 hours/year
 - Amount according to share
 - Associate 'owns' the data 365 days
- Other Programs
 - IPY, Time Buyers, Third Party, EISCAT staff ...

Common Programs

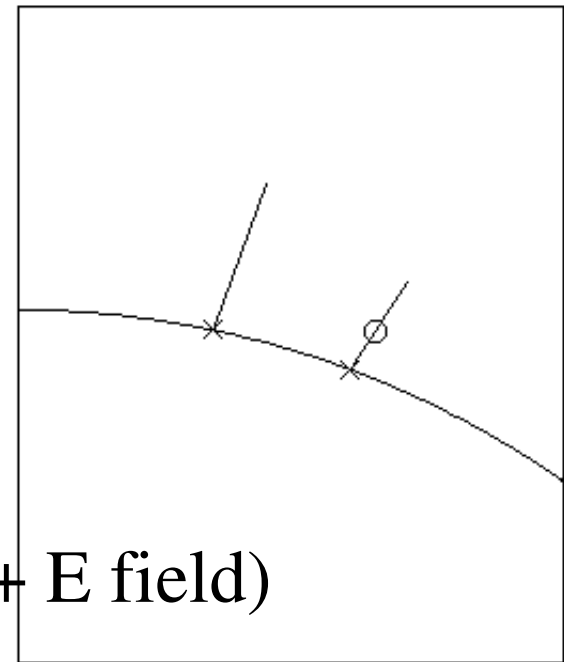
- World Days
 - ~20 days/year
 - URSI working group decides
- Synoptic
 - Statistical studies
 - Season, solar cycle...
- Unusual events
 - Solar eruptions, Eclipse
- (Staff tests)

Common Programs

- CP1

- Stationary along B
- Auroral studies
- High time resolution, < 10 s
- Moderate range resolution, ~ 3 km
- Height profiles of Ne, Te, Ti, Vi (+ E field)
 - E+F region, 90-600 km

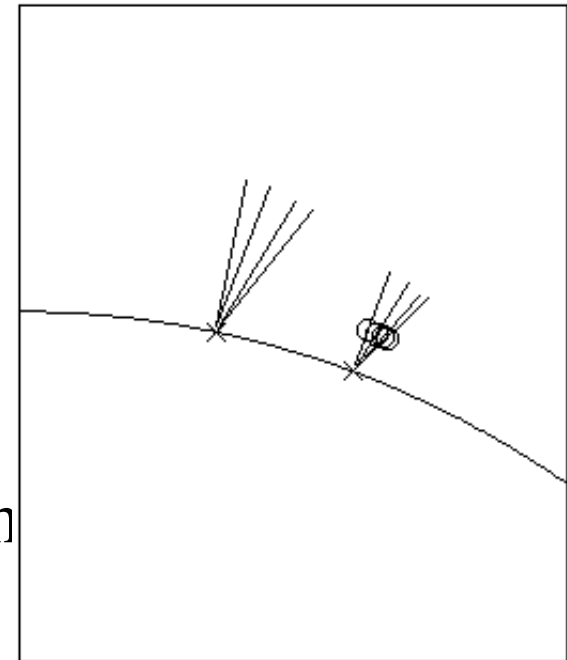
CP1



Common Programs

- CP2
 - 3-4 position scan
 - TID, tides
 - Time resolution 3-6 minutes
 - Moderate range resolution, ~3 km
 - Height profiles Ne, Te, Ti, V_i
 - E+F region 90-600 km
 - <1° latitude at F region

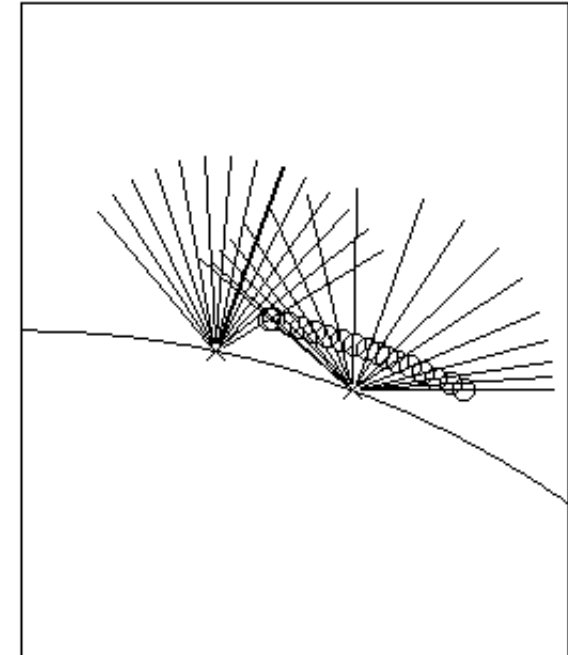
CP2



Common Programs

CP3

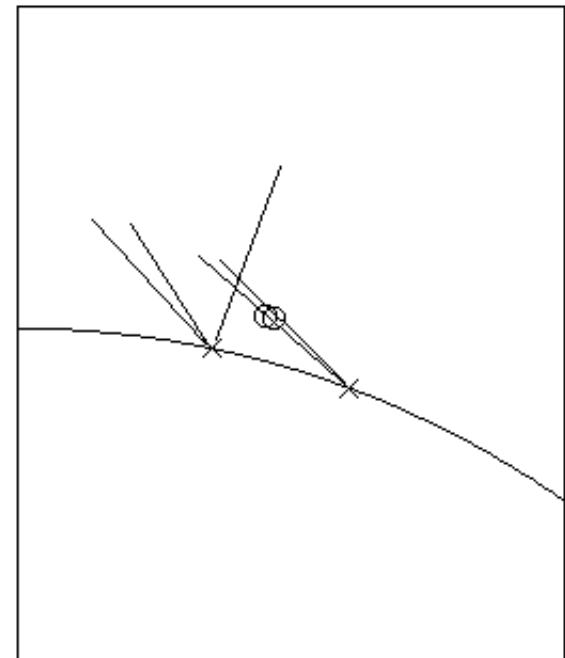
- CP3
 - Wide latitude scan
 - Small East-West motions
 - Convection, troughs, winds
 - Time resolution 20-30 minutes
 - Low range resolution, ~10 km
 - Latitude/height profiles Ne, Te, Ti, Vi
 - E+F region 90-600 km
 - 10° latitude at F region



Common Programs

- CP4
 - Low elevation 2 position scan
 - Convection, troughs
 - Time resolution ~10 minutes
 - Low range resolution, ~10 km
 - Latitude profiles Ne, Te, Ti, Vi
 - E+F region 90-600 km
 - 10° latitude at F region

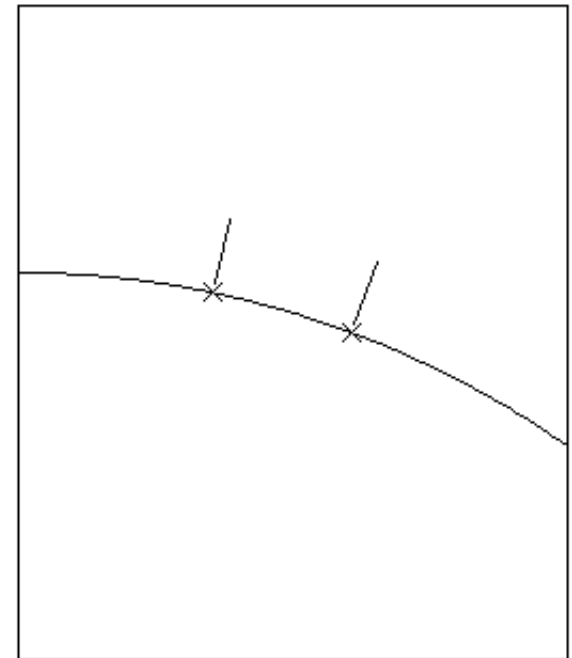
CP4



Common Programs

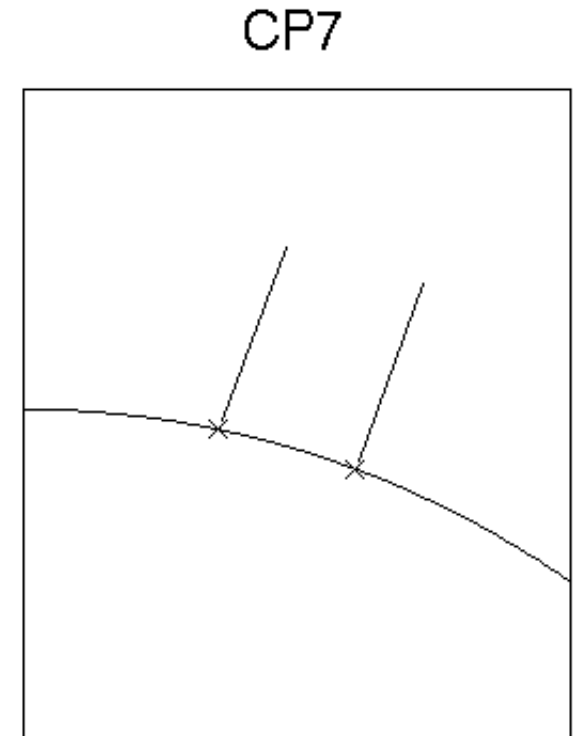
- CP6
 - Stationary vertical
 - Moderate time resolution, $< 1\text{ min}$
 - High range resolution, $\sim 1\text{ km}$
 - High spectral resolution, 10 Hz
 - Profiles of Ne, spectral width, V_i
 - D region, $70\text{-}100\text{ km}$

CP6



Common Programs

- CP7
 - Stationary at high elevation
 - Topside studies
 - Low time resolution, ~5 minutes
 - Profiles of Ne, Te, Ti, Vi
 - F+ region, 100-2000 km



Alternating codes

- Used in all EISCAT Common Programs
- Powerful
 - Side lobe free
 - Same code for all altitudes
 - All transmitter power used at all altitudes
- Robust
 - Background removed in the decoding process
 - Taken at target ranges
- Need stable target over the cycle time
 -

Alternating codes

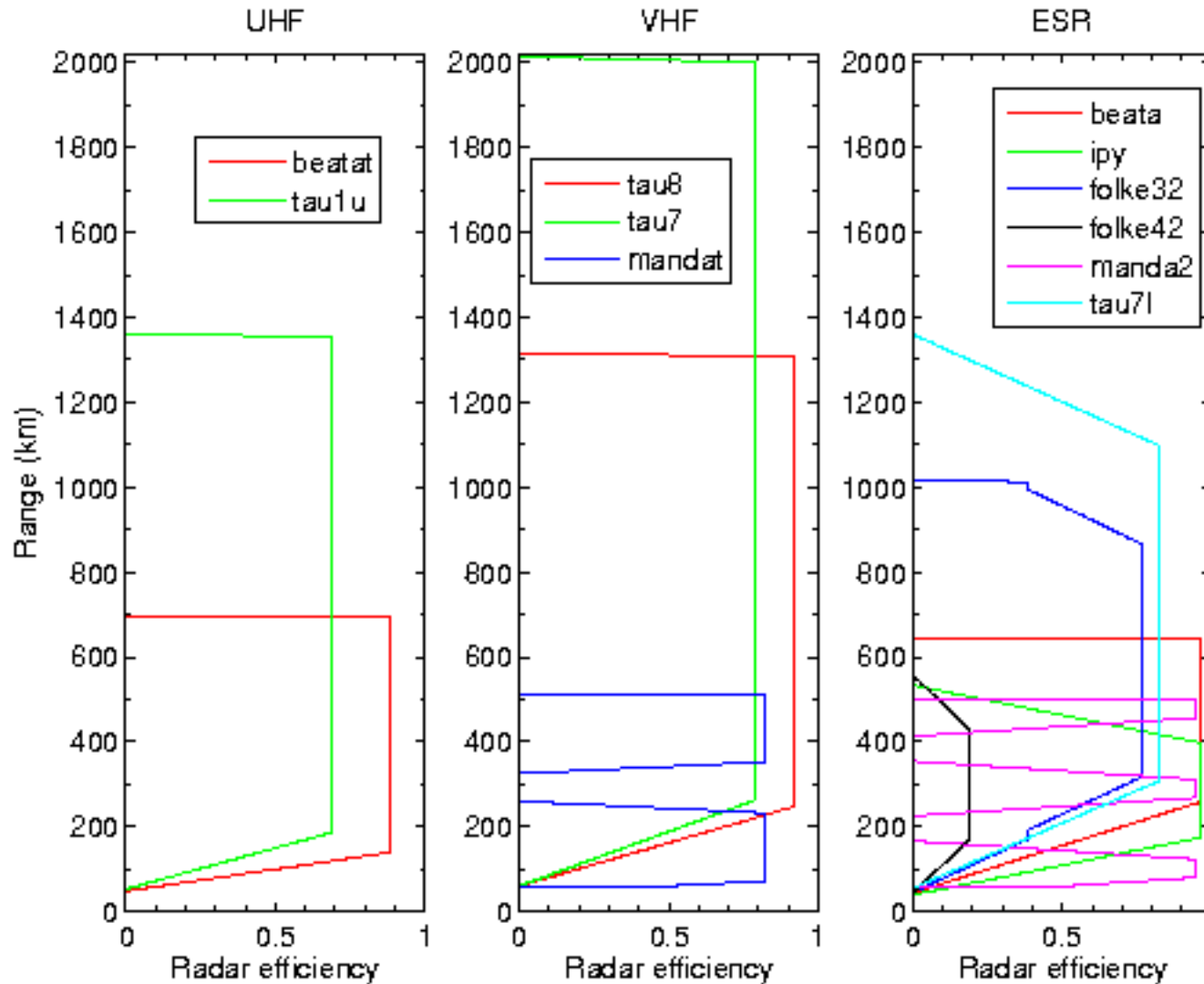
- Oversampling relative the bit length
 - Fractional lags
 - Reduces code cycle
 - Improved height resolution
 - Lower ranges
 - Wider frequency band (high temps)
 - Higher ranges

Special Programs

- Like a CP but at other times
 - Availability of other instruments
 - Satellites, Cameras, Coherent radars, Heater
 - Special events
 - PMSE
- Use CP dsp setup but point somewhere else
 - Rockets, aurora
- Use own developed dsp
 - For experienced users

Common Programs

	CP1	CP2	CP3	CP4	CP5	CP6	CP7
Dsp exp U	beata	beata	tau1	tau1			
Dsp exp V	beata			tau8		manda	tau7
Dsp exp L	beata	ipy	folke	folke		manda	tau7



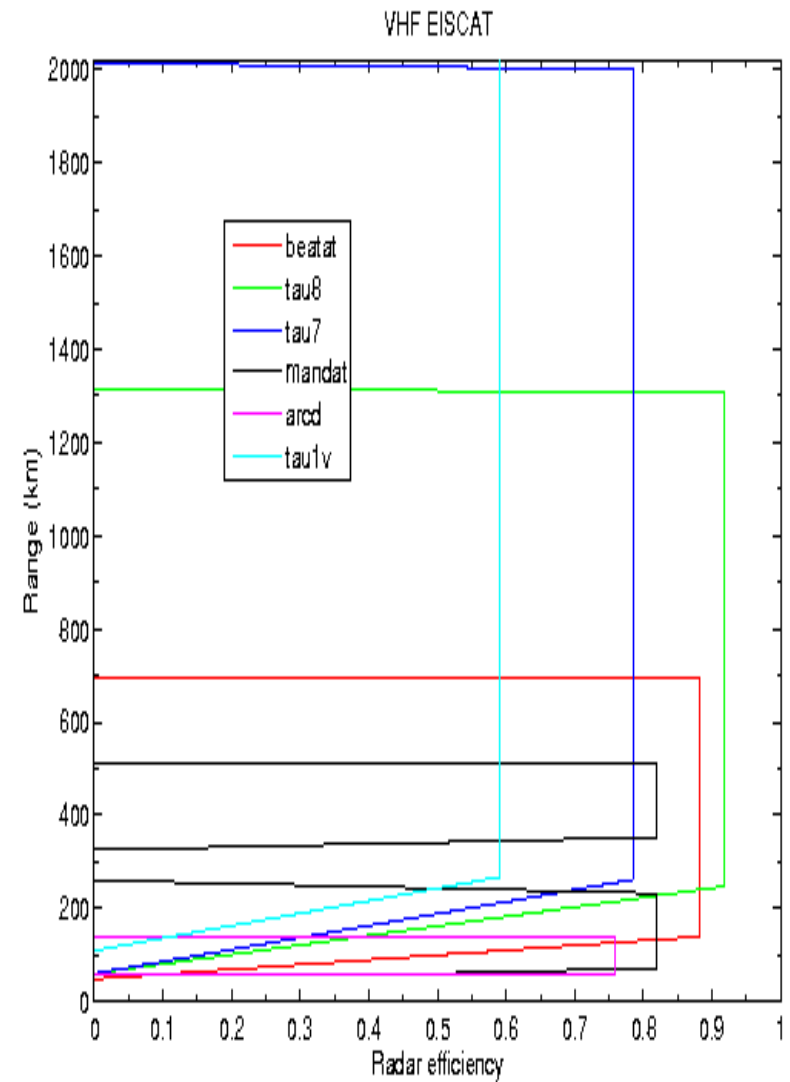
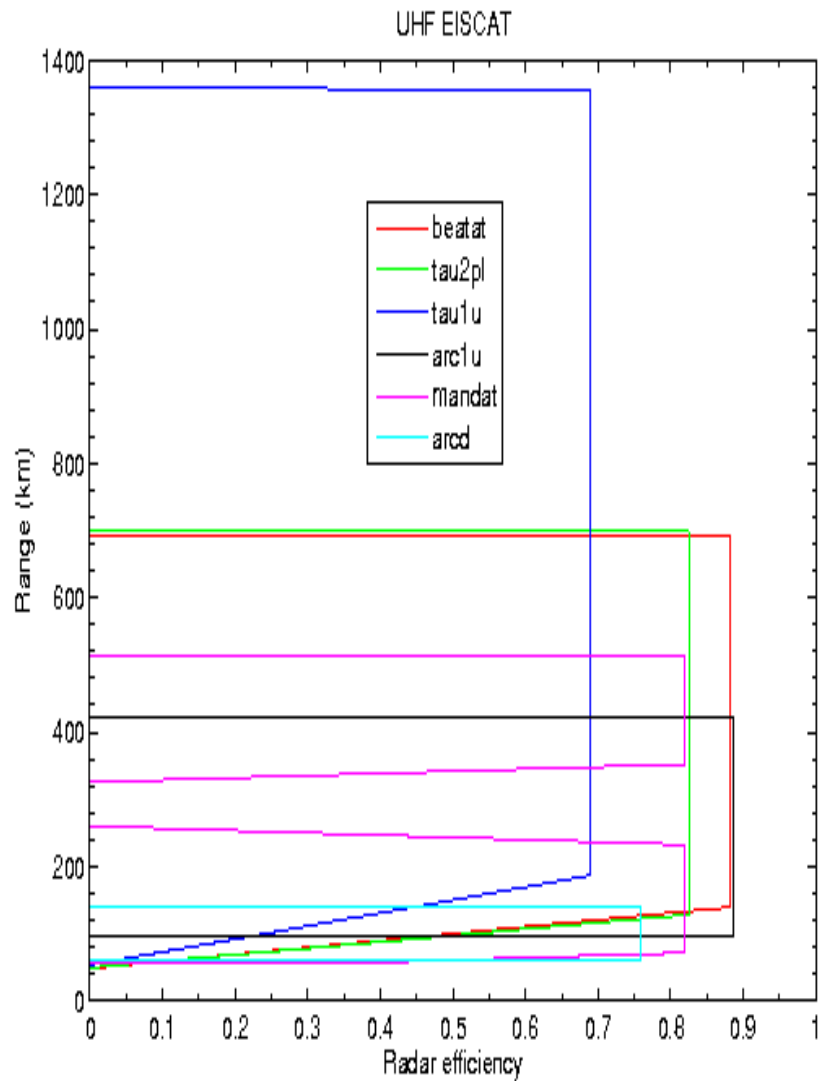
KST experiments

Dsp exp	Type
beata	High elevation, (D)EF region, moderate/high resolution
tau1	Low elevation, E+F region, moderate resolution
tau8	High/Low elevation, E+F region, moderate resolution
manda	High elevation, D(EF) region, high resolution
tau7	High/Low elevation, (E)F region +topside, low resolution
arc_dlayer	High elevation, D region, high resolution
arc1	High elevation, E+F region, high resolution
tau2pl	High elevation, E+F region, moderate resolution

KST experiments

Dsp exp	Radar	Pulses (μ s)	Sampling (μ s)	Resolution (km)	Ranges (km)	Plasma line	Time resolution (s)
beata	UHF	32x20 AC	10	1.5 – 3	49-694	1x1x2.5MHz	5
	VHF	32x20 AC	20	3	49-694	2x1x1.7MHz	5
tau1	UHF	two 16x60 AC	12	1.8 – 9	54-1361		5
	VHF	two 16x72 AC	24	4 – 11	61-2014		5
tau8	VHF	two 16x84 AC	14	2 – 12.5	61-1317	1x1x1.7MHz	5
manda	UHF/VHF	64x3 AC	3	0.45	58.5-513		6
tau7	VHF	two 16x96 AC	12	2 – 14	61-2014		5
arc_dlayer	UHF/VHF	64x2 AC	2	0.3	60-140		5
arc1	UHF	64x6 AC	6	0.9	96-422		0.44
tau2pl	UHF	two 16x36 AC	12	1.8 – 5.4	50-702	1x8x170 kHz	5

KST experiments



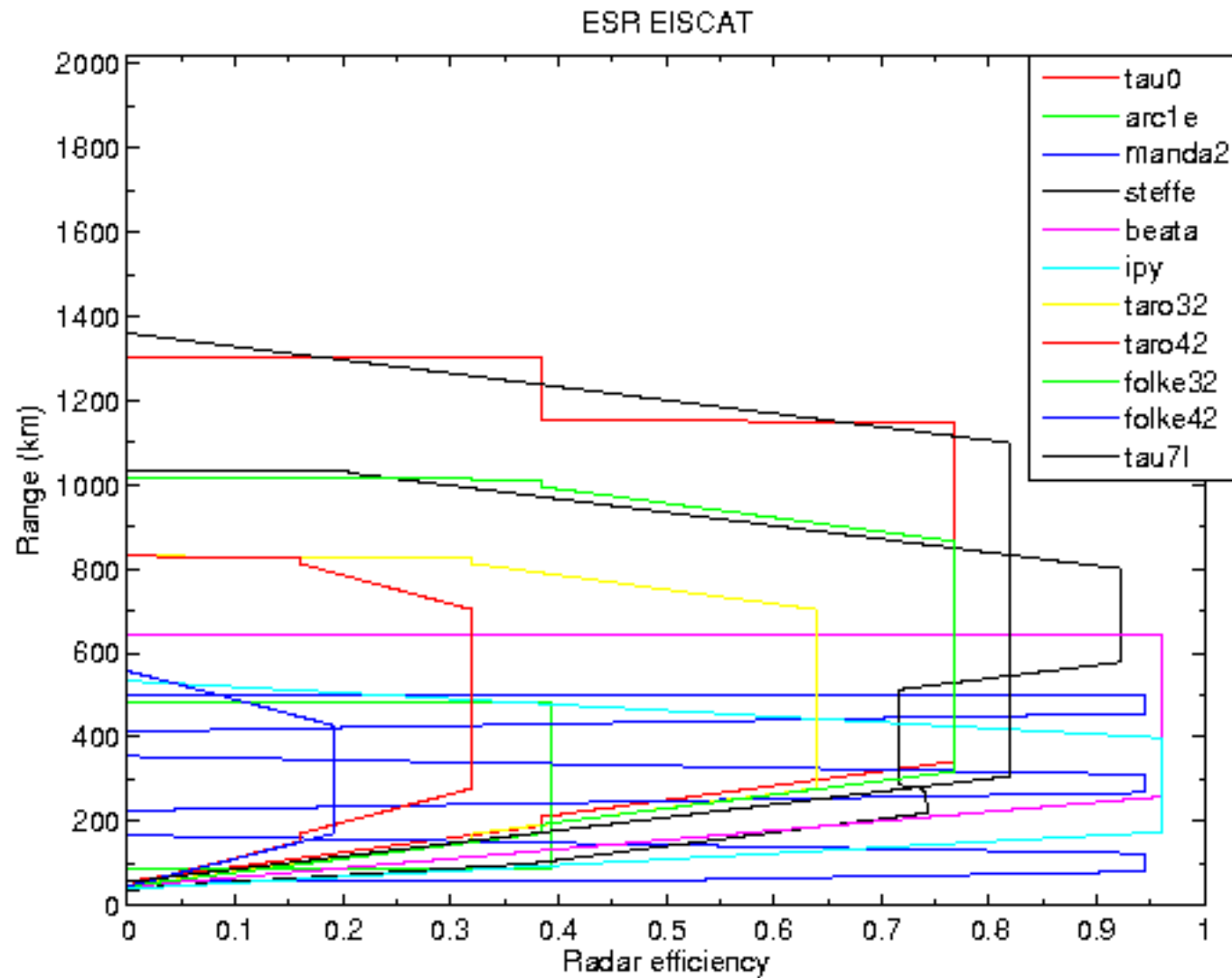
ESR experiments

Dsp exp	Type
beata	High elevation, E+F region, moderate resolution
folke	42m, E+F region, moderate resolution Low elevation 32m, E+F region, moderate resolution
manda	High elevation, D(EF) region, high resolution
ipy	High elevation, (D)EF region, moderate/high resolution
tau7	High elevation, F region+topside, low resolution
arc_slice	High elevation, E+F region, high resolution
hilde	42m, E+F region, moderate resolution Low elevation 32m, E+F region, moderate resolution
taro	42m, E+F region, moderate elevation High elevation 32m, E+F region, moderate resolution
steffe	High elevation, E+F region, moderate resolution
tau0	Low elevation, E+F region, moderate resolution

ESR experiments

Dsp exp	Antenna	Pulses (μ s)	Sampling (μ s)	Resolution (km)	Ranges (km)	Plasma line	Time resolution (s)
beata	Single, switchable	30x50 AC	25	3.8 – 7.5	36-1034	2x1x2.5 MHz	6
folke	Dual 4:1	16x60 AC 4x16x60 AC	20	3 – 9	46-557 46-1018	1x1x1.5MHz	6.4
manda	Single	59x5 AC	5	0.75	60-499		4
ipy	Single, switchable	30x30 AC	15	2.2 – 4.5	43-507	2x1x2.5 MHz	6
tau7	Single, switchable	16x120 AC	5	0.8 – 18	56-1360	2x1x2.5 MHz	6
arc_slice	Single, switchable	64x6 AC	6	0.9	85-481		0.5
hilde	Dual 1:1	16x32 + 16x96 AC 2x16x60 AC	16 20	2.4 – 14 3 – 9	36-965 (2000) 58-1304		5.1
taro	Dual 2:1	16x50 AC	25	3.8 – 7.5	46-812		6.4
steffe	Single, switchable	16x30 + 16x105 AC	15	2.2 – 16	36-1034	2x2x1.7 MHz	6
tau0	Single, switchable	2x16x60 AC	20	3 – 9	58-1304		6.4

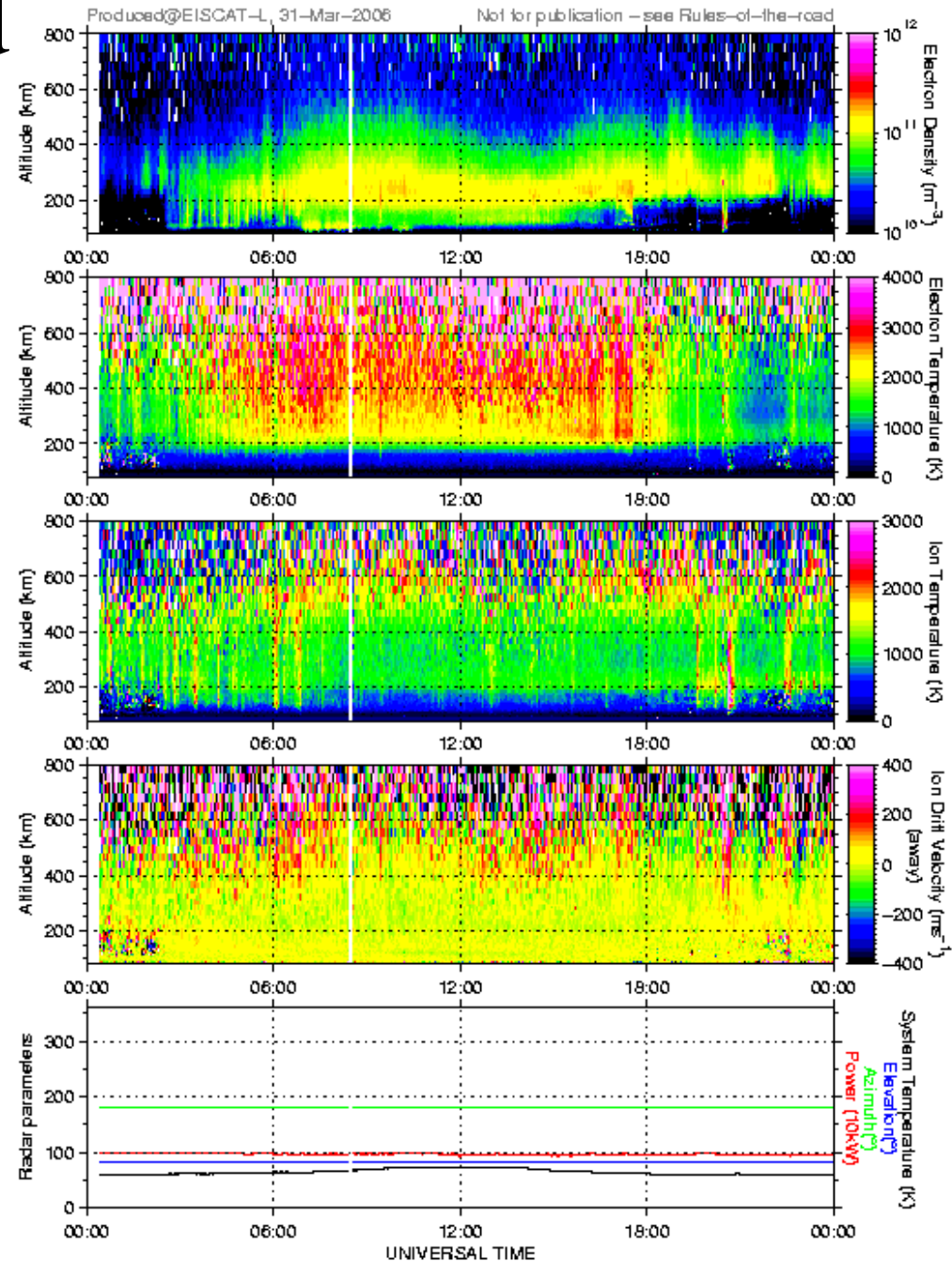
ESR experiments





Normal overspread method

- Correlations within the pulse
- Most experiments
 - Lower height limit dependent on radar
 - UHF >90km
 - VHF >120 km
 - ESR >100 km
 - Analysable by GUISDAP



Underspread method

manda 2006-02-16 1027:16 40s 962kW 182.1/81.6

- Correlations between pulses
- D region
 - VHF
 - OK
 - UHF
 - Debye limit problem
 - ESR
 - Ground clutter
- Not yet GUISDAP
- CP6
 - combines over- and underspread methods

