

SCATSAT-1 Scatterometer Level-1B Data Quality Evaluation Report

Table of Contents

- Half-Orbit Coverage using BT & Sigma-0
- Invariant Site Sigma-0 Statistics (if Available)
- Half-Orbit Data Statistics
- Half Orbit wise - Dynamic Parameter (Sigma-0, Kp, SNR) Behaviour
- Dynamic Range (Data Histogram)
- Half Orbit Wise Behaviour - Static Parameters
- Doppler Variation (Across/Along Track for HH/VV Beam)
- LIB Parameter as a function of Latitude
- Half Orbit OAT Behaviour

Satellite Id	ScatSat-1	Start Orbit	19264	Total Scans	1017
Sensor Name	Scatterometer	End Orbit	19265	No of Inner FootPrints	281
Processor Version	v1.1.4	Rev. Number	19264_19265	No Of Outer FootPrints	282
Half Orbit Direction	SN	Data Production Date	17-05-2020	No. Of Inner Slices	9
Equator Crossing Date	16-05-2020	Equator Crossing Time	19:29:46.000	No Of Outer Slices	15

Brightness Temperature(k) Footprint trace

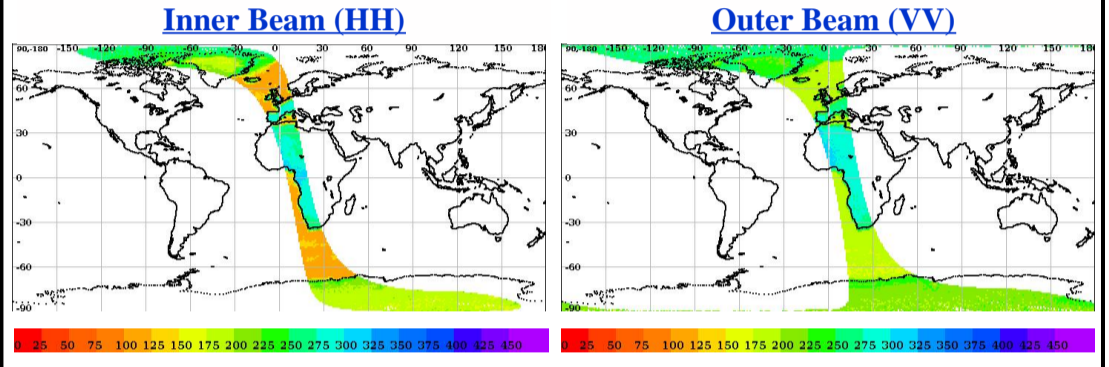
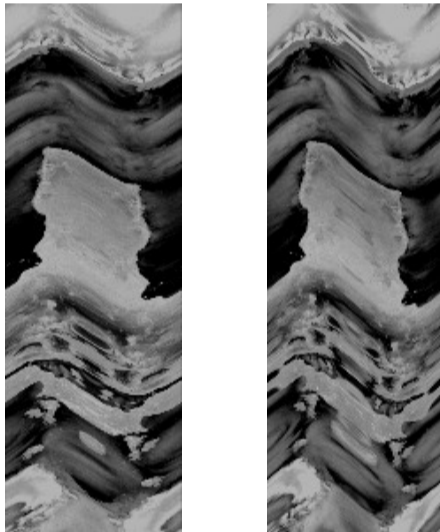


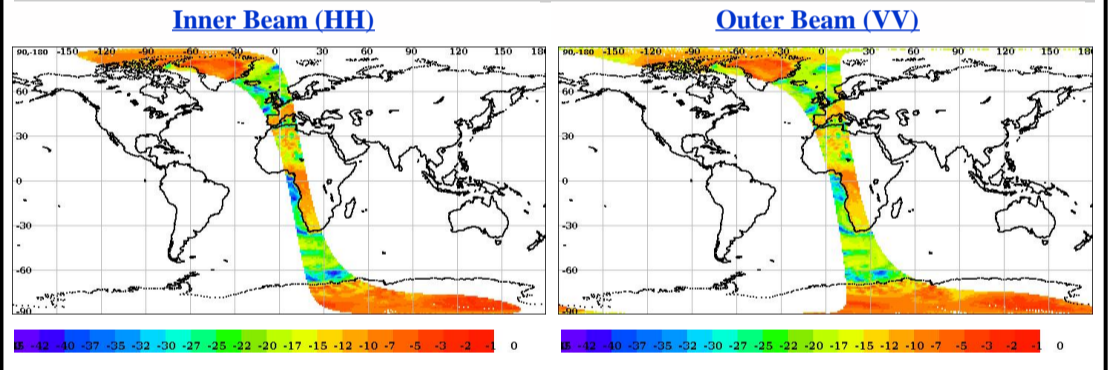
Image Snapshot for Inner & Outer Beam

Inner (HH)

Outer (VV)



Sigma0(dB) Footprint trace



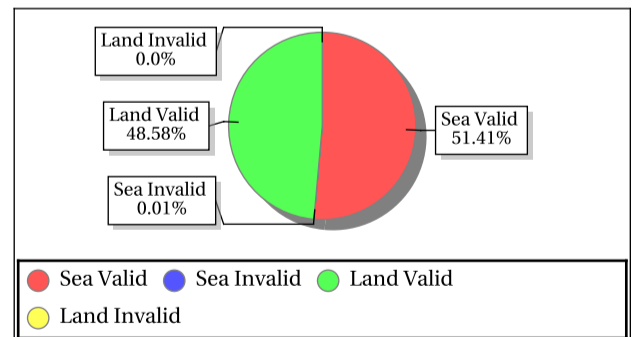
Invalid and Poor Sigma-0 Quality Flag Statistics for Inner/Outer Slices*

Sigma-0 Flags	Inner Beam	Outer Beam
Invalid Sigma0(%)	0.01	0.05
Data Not Available From Payload (%)	100.0	21.61605
Slice not within sample array limits (%)	0.00	78.38
C(S+N) - C(N) < 0.1 (%)	0.00	0.00
Poor Sigma0(%)	22.23	13.34
Noise samples for blending Saturated	0.003149	0.0
Count samp. for interpol. saturated (%)	0.00	0.00
Sigma0<lower bound (-96dB) (%)	0.0	0.0
Sigma0>upper bound (0 dB) (%)	0.00	0.00
SNR <-65 dB (%)	0.029564	0.063261

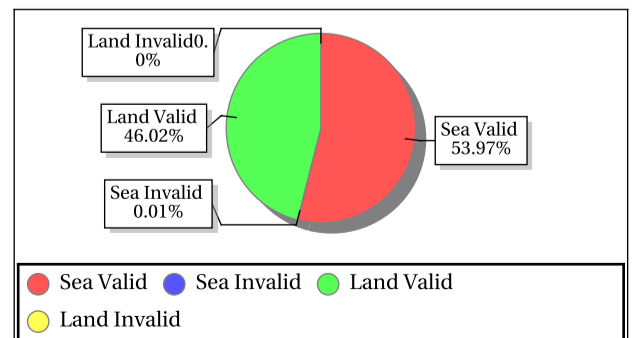
*DP Format Document

Sigma-0 Quality Flag Statistics for Inner/Outer Footprints

Inner Beam (HH)



Outer Beam (VV)



Invariant Site Sigma-0 Statistics for Ascending/Descending, Fore/Aft in HH/VV beams

Site Name	Center Lat	Center Lon	Beam	Node	ScanDir	Sigma0 Min	Sigma0 Max	Sigma0 Mean	Sigma0 Std	BT Min	BT Max	BT Mean	BT Std
GreenLand_2	77.50	-41.50	Inner	ASC	Aft	-6.12	-4.66	-5.44	0.49	179.52	190.98	185.00	3.78
GreenLand_2	77.50	-41.50	Inner	ASC	Fore	-6.39	-5.10	-5.74	0.64	168.77	190.51	179.64	10.87
GreenLand_3	71.55	-42.45	Inner	ASC	Aft	-12.26	-8.62	-9.99	0.76	176.90	232.73	207.28	13.86
GreenLand_3	71.55	-42.45	Inner	ASC	Fore	-10.76	-8.48	-9.80	0.52	183.58	233.74	210.45	12.06
GreenLand_1	74.69	-42.50	Inner	ASC	Aft	-11.00	-8.33	-9.40	0.78	168.74	213.47	193.07	15.00
GreenLand_1	74.69	-42.50	Inner	ASC	Fore	-10.44	-7.38	-9.24	1.02	168.41	201.59	188.62	8.89
Sahara	19.10	14.30	Inner	ASC	Aft	-29.22	-21.01	-25.41	2.52	224.37	308.99	269.90	17.19
Sahara	19.10	14.30	Inner	ASC	Fore	-31.89	-20.67	-26.07	3.10	225.35	315.56	268.96	16.37
ANT_1	-75.00	121.00	Outer	ASC	Aft	-9.29	-7.03	-8.34	0.79	180.52	223.13	208.35	11.00
GreenLand_2	77.50	-41.50	Outer	ASC	Aft	-5.91	-5.07	-5.49	0.42	202.35	226.07	214.21	11.86
GreenLand_2	77.50	-41.50	Outer	ASC	Fore	-5.50	-4.98	-5.26	0.17	221.40	249.14	234.23	8.98
GreenLand_3	71.55	-42.45	Outer	ASC	Aft	-12.14	-10.68	-11.35	0.42	219.43	274.26	241.81	15.70
GreenLand_3	71.55	-42.45	Outer	ASC	Fore	-12.02	-10.33	-11.24	0.36	218.99	266.11	241.79	12.53
GreenLand_1	74.69	-42.50	Outer	ASC	Aft	-10.36	-8.90	-9.66	0.46	210.84	264.65	243.29	18.54
GreenLand_1	74.69	-42.50	Outer	ASC	Fore	-10.04	-7.73	-8.88	0.64	230.67	281.14	248.42	14.76
Sahara	19.10	14.30	Outer	ASC	Aft	-29.01	-22.13	-25.62	1.72	265.96	334.27	295.67	16.64
Sahara	19.10	14.30	Outer	ASC	Fore	-32.64	-20.89	-26.32	2.89	263.62	327.24	294.42	14.79



Overall statistics for the Static Parameters (Footprint-wise)

Inner Beam (HH)																
	Sea Aft				Sea Fore				Land Aft				Land fore			
	Min	Max	Mean	Bad Occ. (%)	Min	Max	Mean	Bad Occ. (%)	Min	Max	Mean	Bad Occ. (%)	Min	Max	Mean	Bad Occ. (%)
Kp	0.12	274.33	0.34	3.148	0.12	298.79	0.36	3.179	0.12	0.27	0.12	0.000	0.12	0.32	0.12	0.000
Kpa	0.01	0.02	0.01	0.000	0.01	0.02	0.01	0.000	0.01	0.01	0.01	0.000	0.01	0.01	0.01	0.000
Kpb	0.02	0.02	0.02	0.000	0.02	0.02	0.02	0.000	0.02	0.02	0.02	0.000	0.02	0.02	0.02	0.000
Kpc	0.01	0.01	0.01	0.000	0.01	0.01	0.01	0.000	0.01	0.01	0.01	0.000	0.01	0.01	0.01	0.000
SNR	-34.52	25.05	5.13	0.017	-34.89	24.31	6.33	0.222	-2.59	29.85	17.84	14.718	-3.67	29.28	18.15	16.235

Outer Beam (VV)																
	Sea Aft				Sea Fore				Land Aft				Land fore			
	Min	Max	Mean	Bad Occ. (%)	Min	Max	Mean	Bad Occ. (%)	Min	Max	Mean	Bad Occ. (%)	Min	Max	Mean	Bad Occ. (%)
Kp	0.09	215.83	0.31	2.784	0.09	198.78	0.27	2.306	0.09	3.36	0.09	0.004	0.09	3.01	0.09	0.003
Kpa	0.01	0.01	0.01	0.000	0.01	0.01	0.01	0.000	0.01	0.01	0.01	0.000	0.01	0.01	0.01	0.000
Kpb	0.01	0.01	0.01	0.000	0.01	0.01	0.01	0.000	0.01	0.01	0.01	0.000	0.01	0.01	0.01	0.000
Kpc	0.01	0.01	0.01	0.000	0.01	0.01	0.01	0.000	0.01	0.01	0.01	0.000	0.01	0.01	0.01	0.000
SNR	-34.64	18.65	2.97	0.000	-34.29	17.39	3.83	0.000	-16.48	22.91	12.18	0.052	-16.00	22.97	12.15	0.097

Parameter Specifications					
Parameter	Kp	Kpa	Kpb	Kpc	SNR
Min	0.00	0.00	0.00	0.00	-65.00
Max	1.00	1.00	1.00	1.00	22.00

- Normal
- Deviations
- Alarming
- High Errors

Overall statistics for static parameter (Footprint-wise)

	Inner Beam (HH)				Outer Beam (VV)				Parameter Specifications		
	Min	Max	Mean	Bad Occ. (%)	Min	Max	Mean	Bad Occ. (%)	Parameter	Min	Max
Incidence Angle (deg)	48.77	49.46	49.06	0.000	57.52	58.27	57.95	0.000	Inci.(Inner)	47.10	49.90
Azimuth Diff. (deg)	0.0026	215.81	1.27	2.573	0.0000	298.09	1.27	3.888	Inci.(Outer)	57.30	58.90
Range(Km)	1029.66	1082.34	1050.37	0.000	1206.10	1271.80	1231.16	8.156	Azimuth Diff.	0.60	2.00
X Factor(dbm)	-91.52	-89.62	-90.21	0.000	-92.83	-91.66	-92.09	0.000	Range(Inner)	1025.00	1095.70
Across Distance (Km)	15.44	15.97	15.68	0.000	7.29	38.14	20.81	7.000	Range(Outer)	1210.00	1280.00
Along Distance (Km)	18.55	20.79	19.75	0.000	18.36	21.01	19.66	0.000	X-Factor	-100.00	-80.00
									Ac.Distance(Inner)	15.00	20.00
									Ac.Distance(Outer)	15.00	22.00
									Al.Distance(Inner)	15.00	30.00
									Al.Distance(Outer)	10.00	30.00

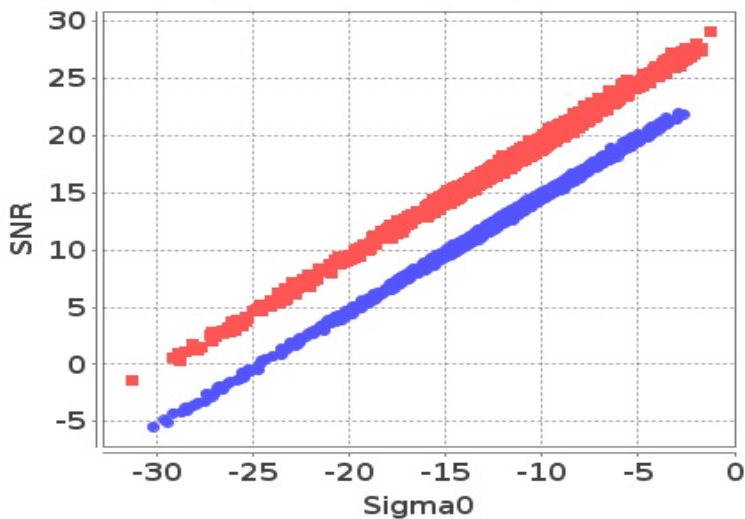
- Normal
- Deviations
- Alarming
- High Errors



Sigma0 Behaviour (Sigma0 Vs SNR)

Footprint-Land

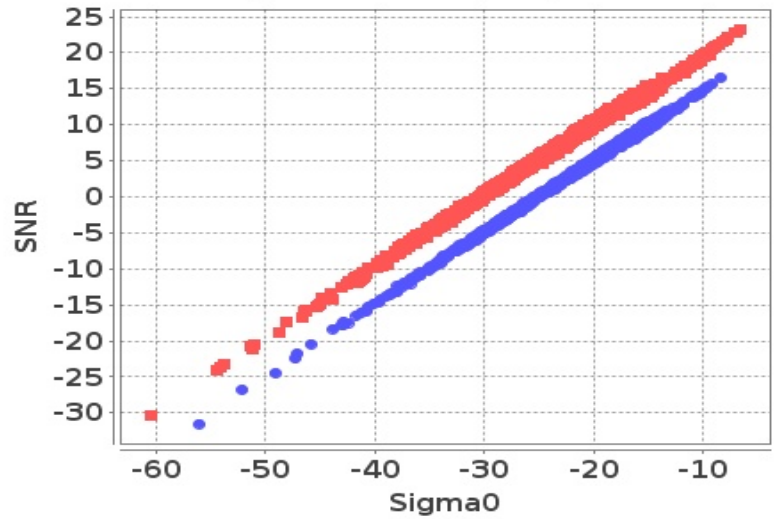
Sigma0 Vs SNR (Land)



■ Inner ● Outer

Footprint-Sea

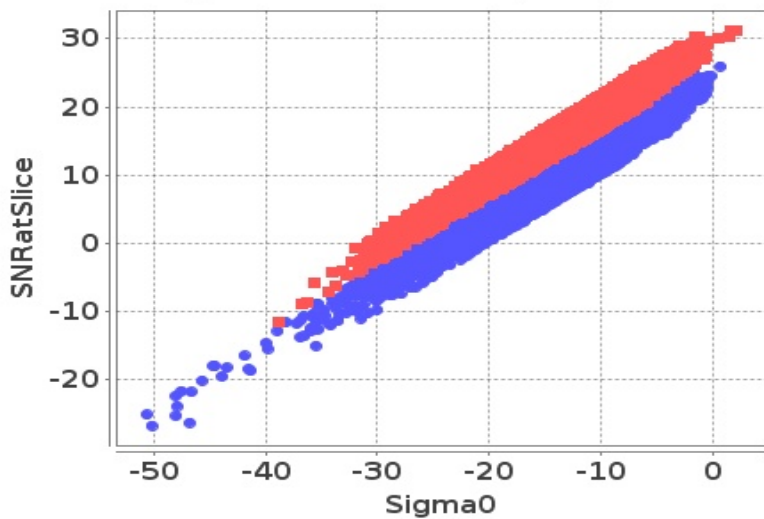
Sigma0 Vs SNR (Sea)



■ Inner ● Outer

Slice-Land

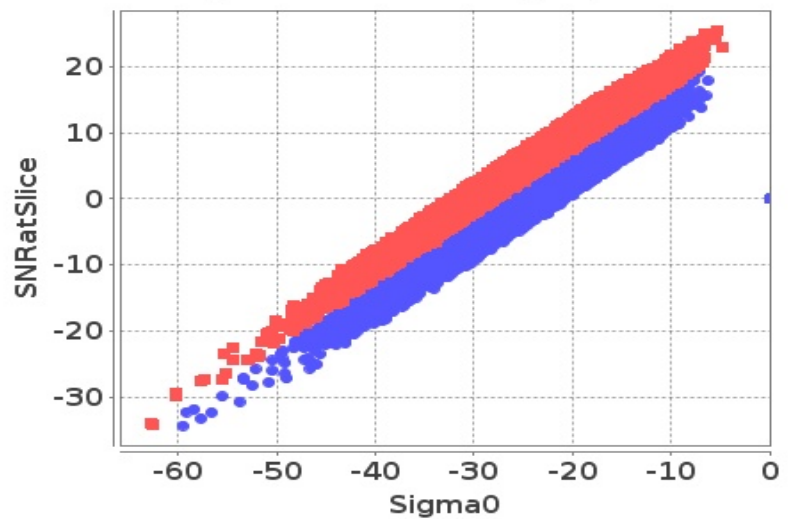
Sigma0 Vs SNRatSlice (Land)



■ Inner ● Outer

Slice-Sea

Sigma0 Vs SNRatSlice (Sea)

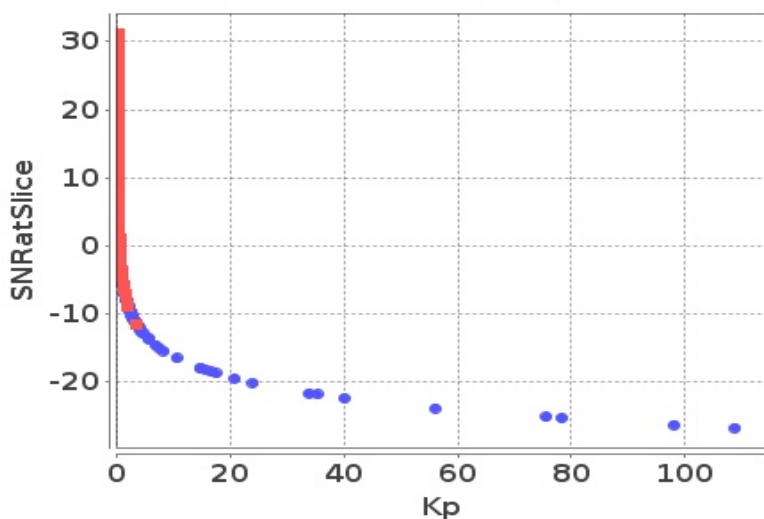


■ Inner ● Outer

Sigma0 Behaviour (Kp Vs SNR)

Slice

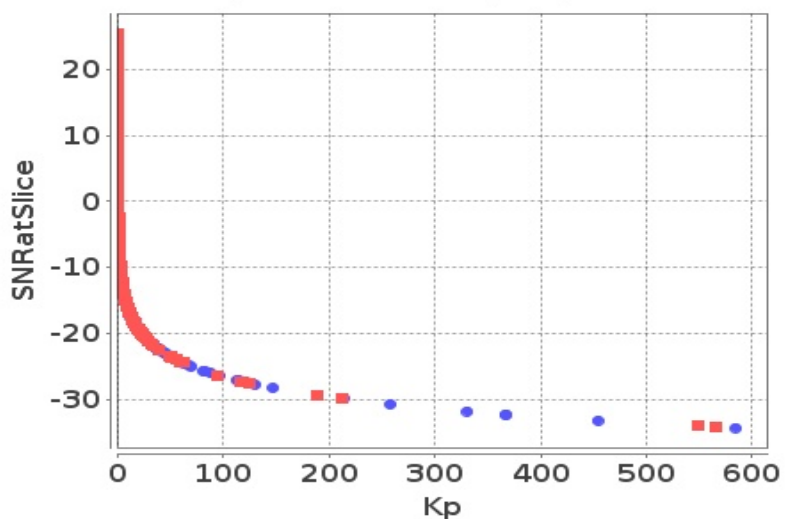
Kp Vs SNRatSlice (Land)



■ Inner ● Outer

Slice

Kp Vs SNRatSlice (Sea)



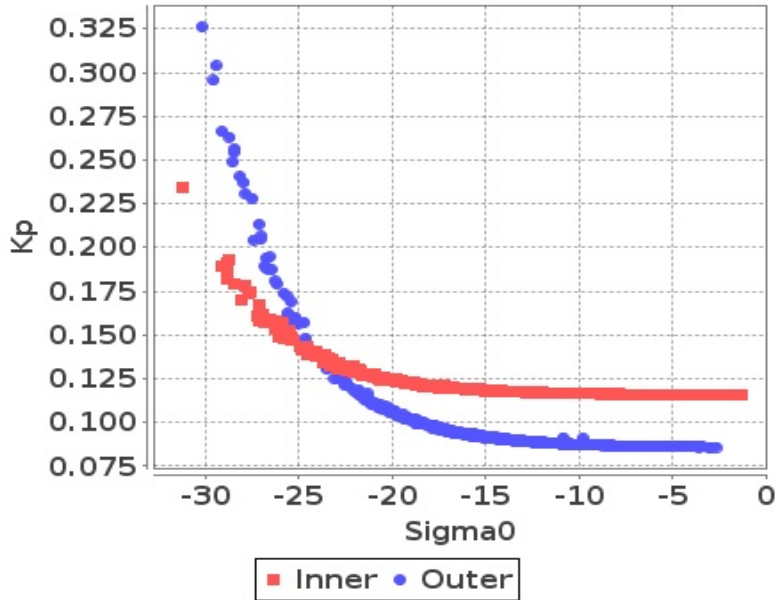
■ Inner ● Outer



Sigma0 Behaviour(Sigma0 Vs Kp)

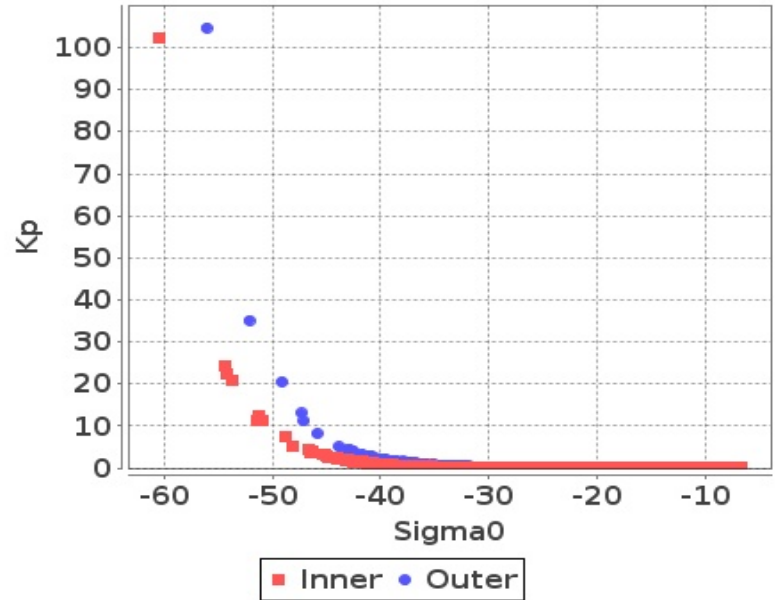
Footprint-Land

Sigma0 Vs Kp (Land)



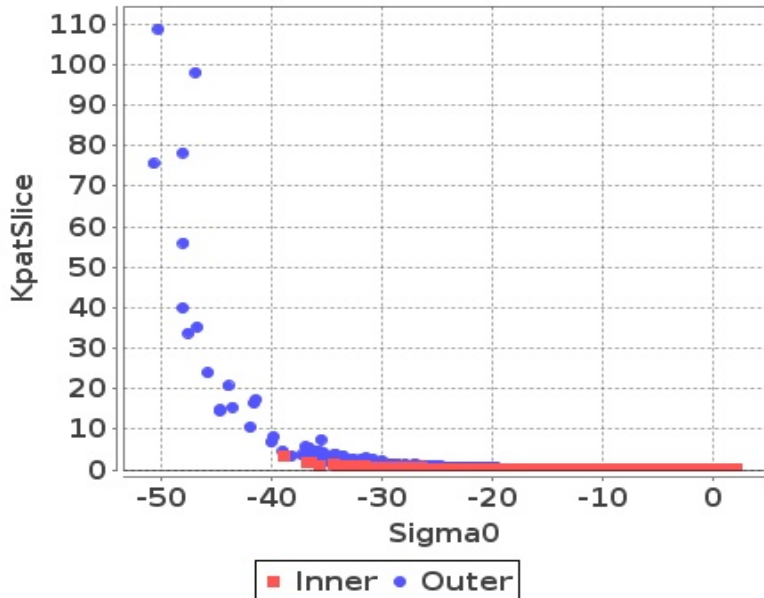
Footprint-Sea

Sigma0 Vs Kp (Sea)



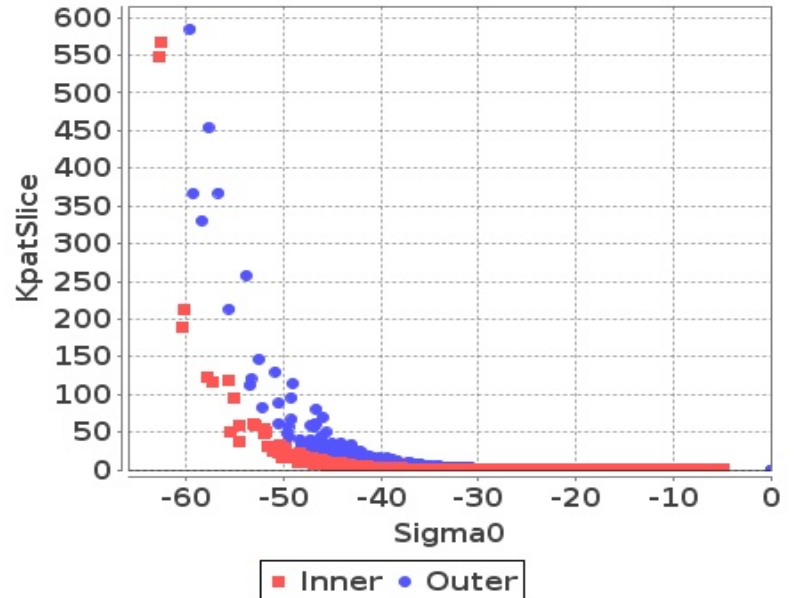
Slice-Land

Sigma0 Vs KpatSlice (Land)



Slice-Sea

Sigma0 Vs KpatSlice (Sea)

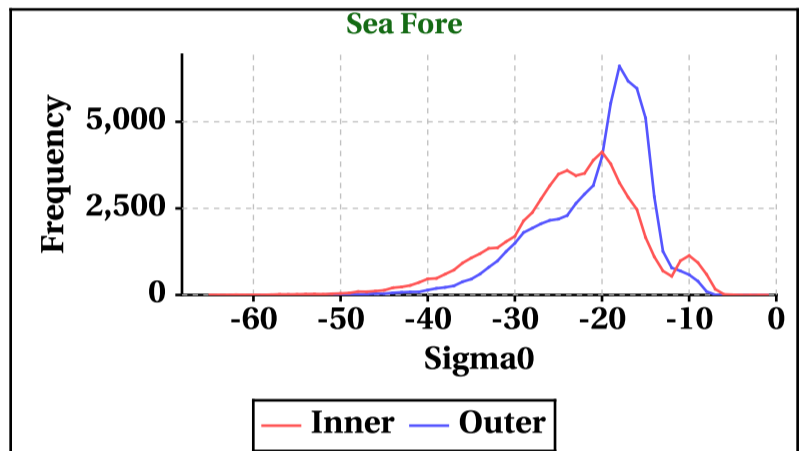
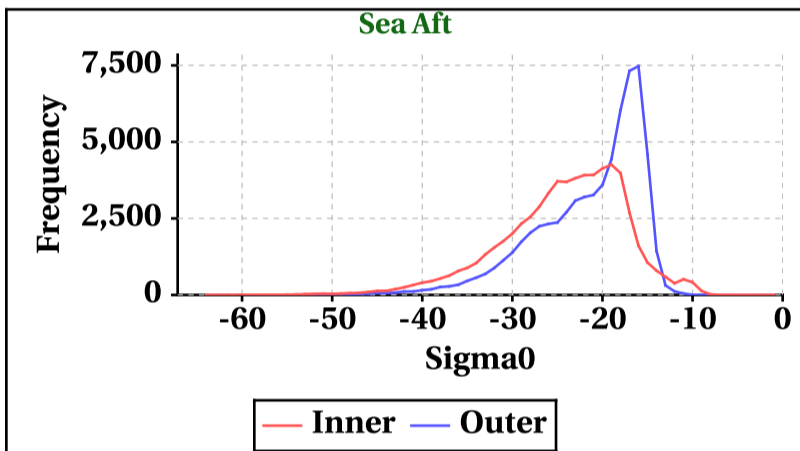
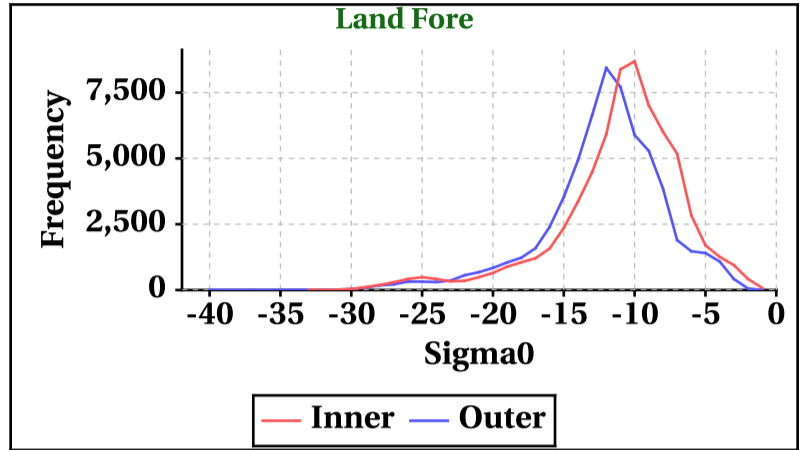
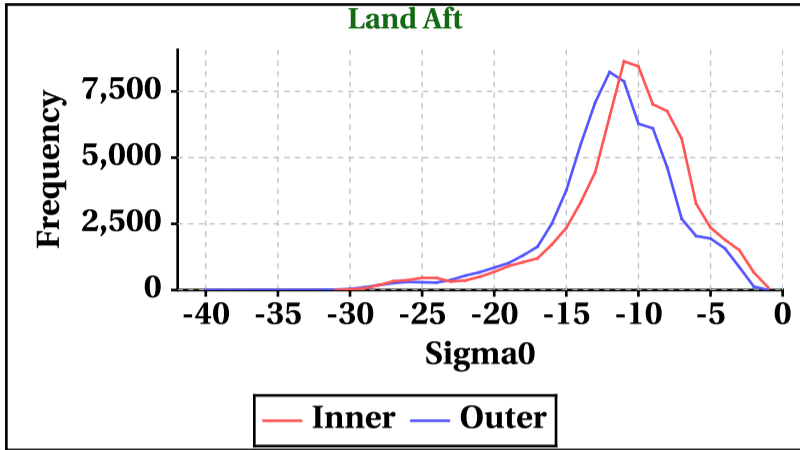


Dynamic Range (Data Histograms)

Sigma0(db)

Inner Beam (HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-31	-33	-64	-65
Max	0	0	0	0

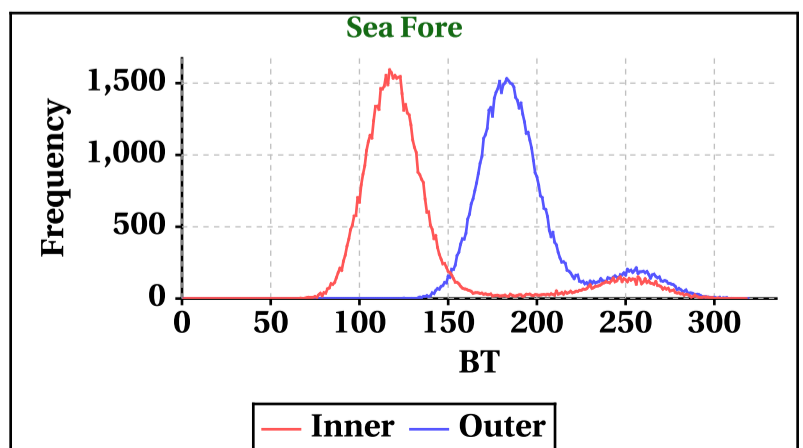
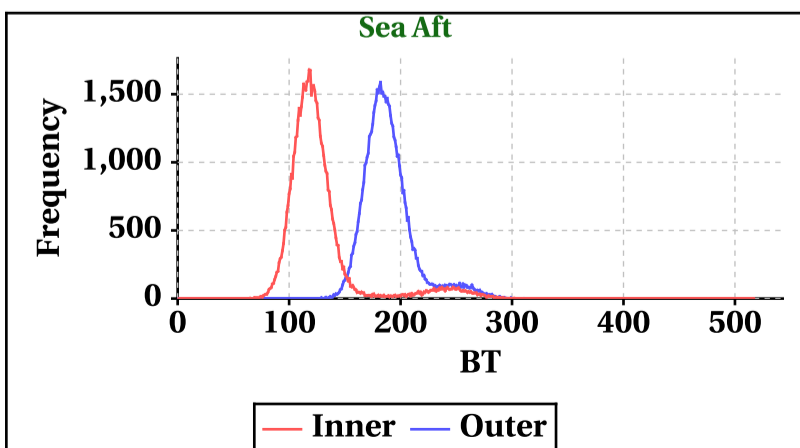
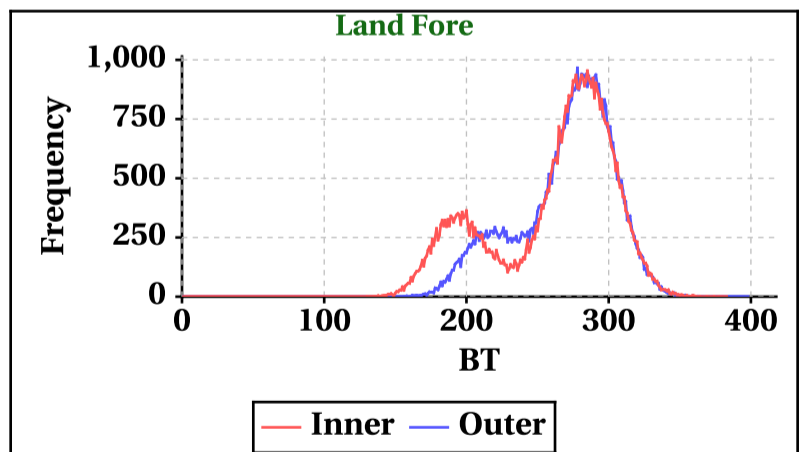
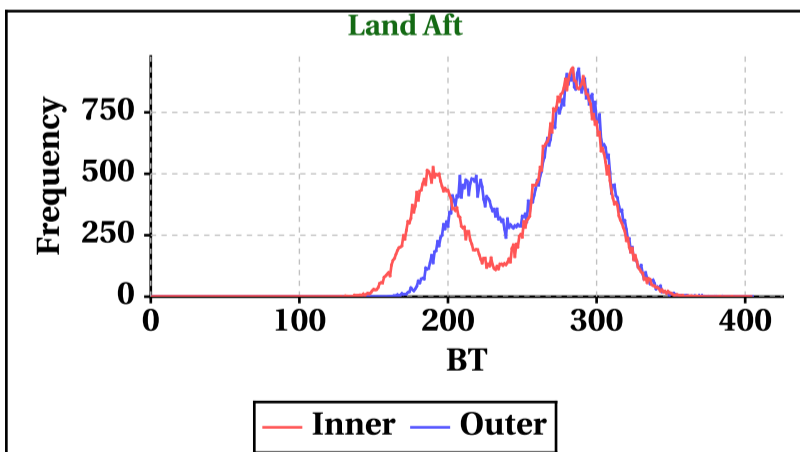
Outer Beam (VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-40	-40	-59	-59
Max	0	0	0	0



Brightness Temperature(K)

Inner Beam(HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	0	0
Max	404	383	517	318

Outer Beam(VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	0	0
Max	405	398	310	319

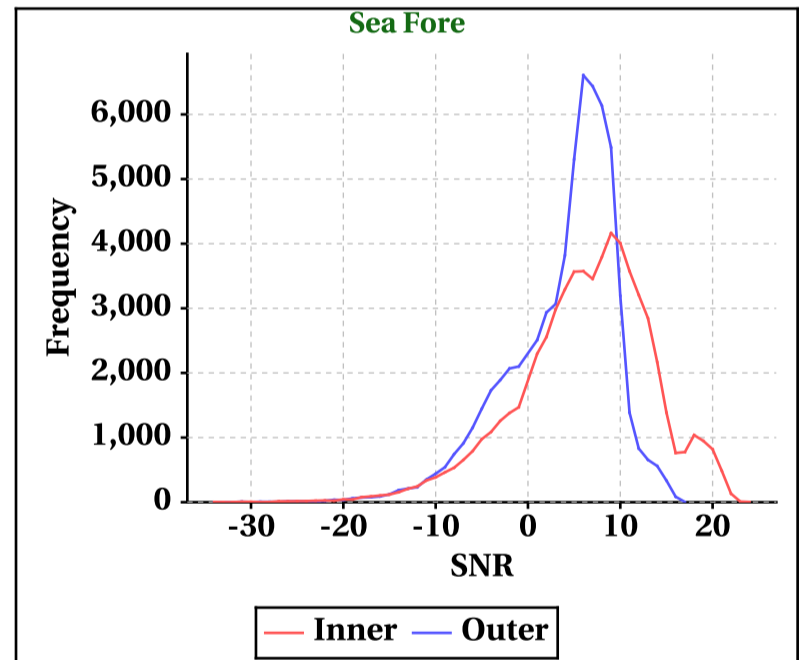
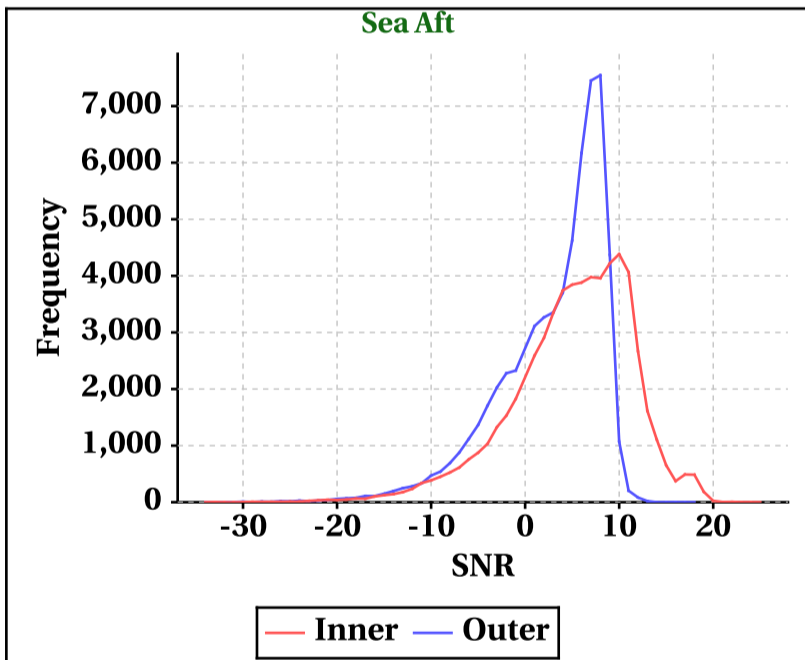
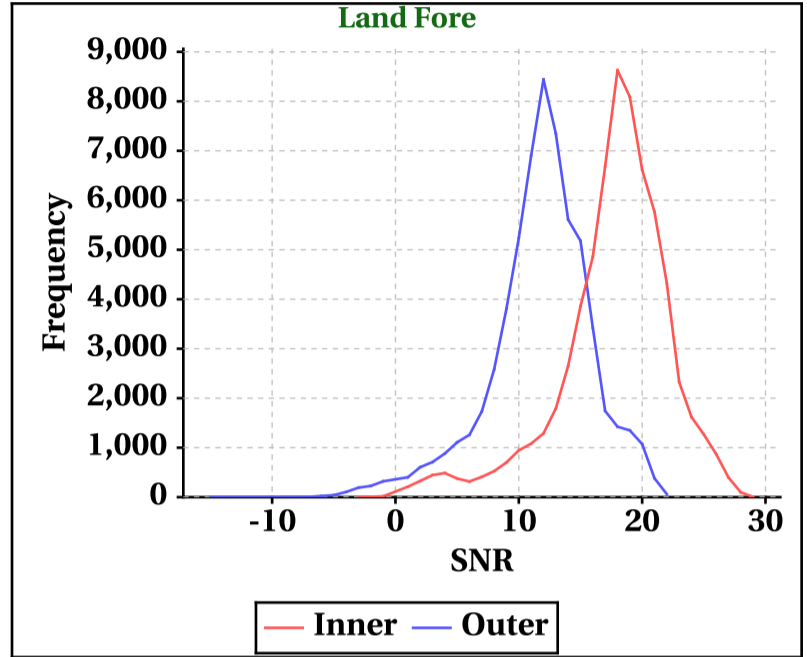
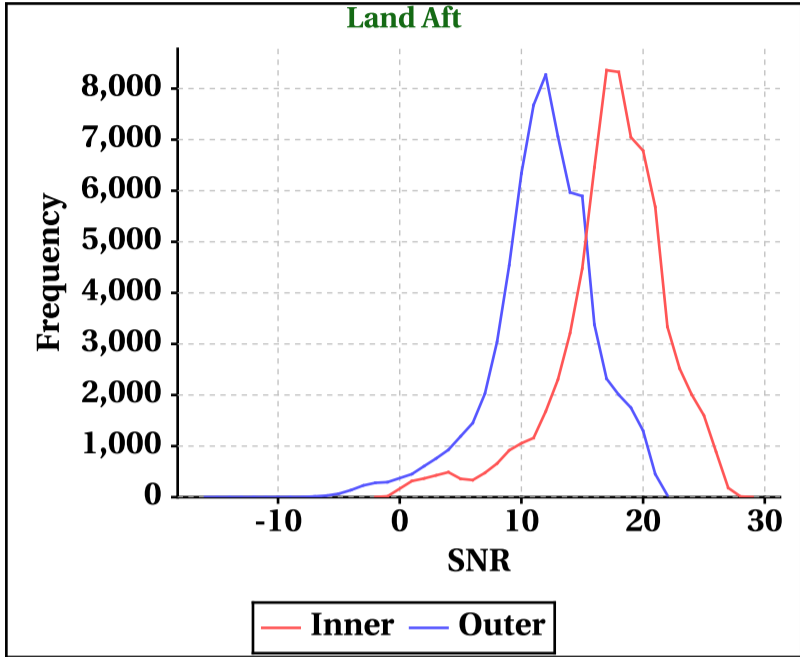


Dynamic Range (Data Histograms)

SNR(dBm)

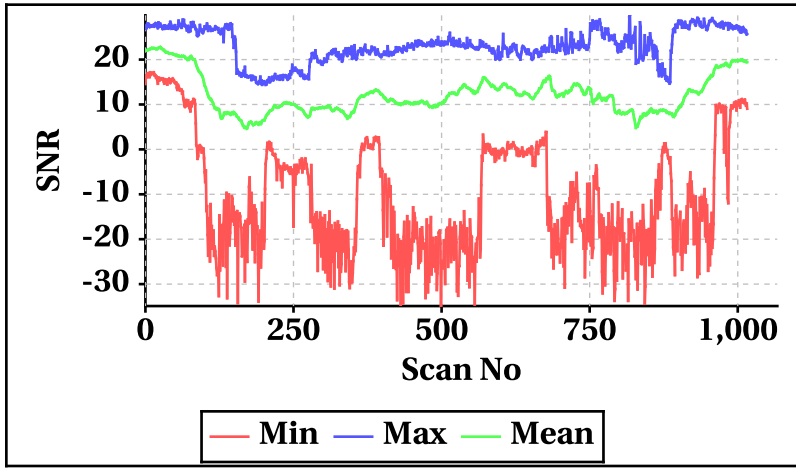
Inner Beam (HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-2	-3	-34	-34
Max	29	29	25	24

Outer Beam (VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-16	-15	-34	-34
Max	22	22	18	17

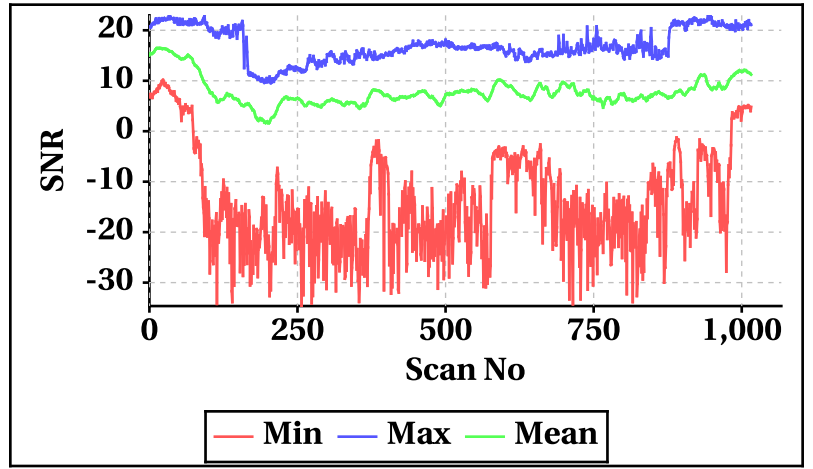


Orbit-wise behaviour of SNR

Inner Beam (HH)

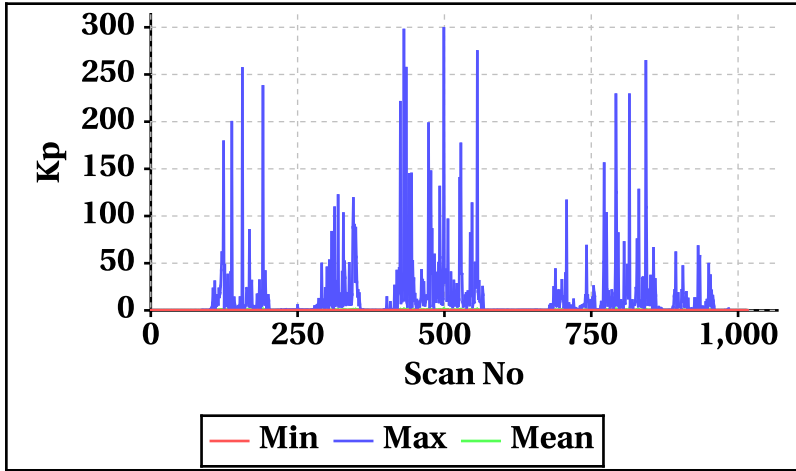


Outer Beam(VV)

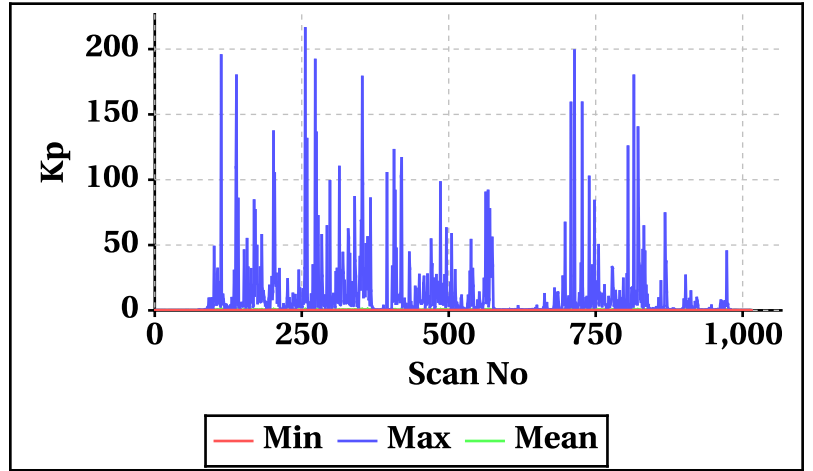


Orbit-wise behaviour of Kp,Kpa,Kpb,Kpc

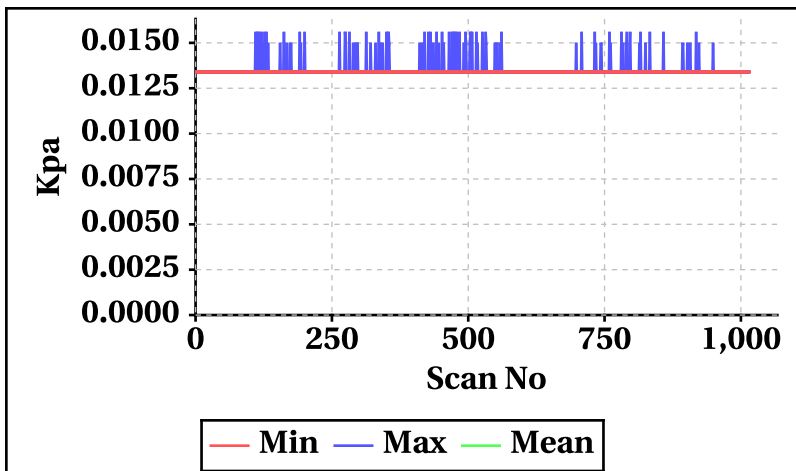
Inner Beam(HH)



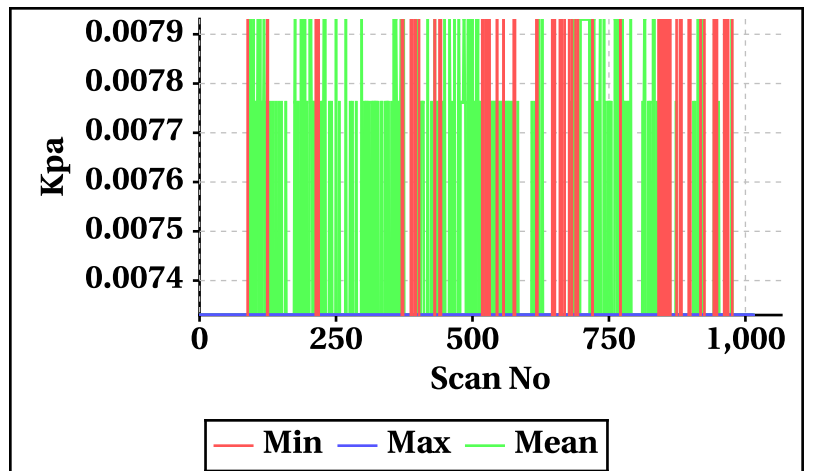
Outer Beam(VV)



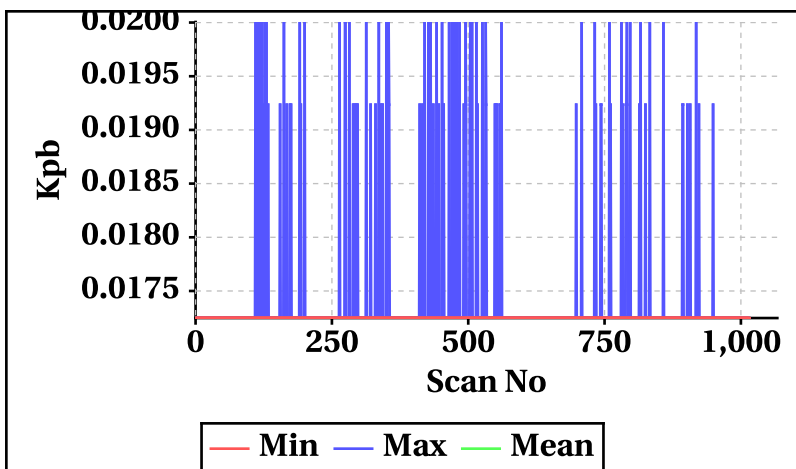
Inner Beam(HH)



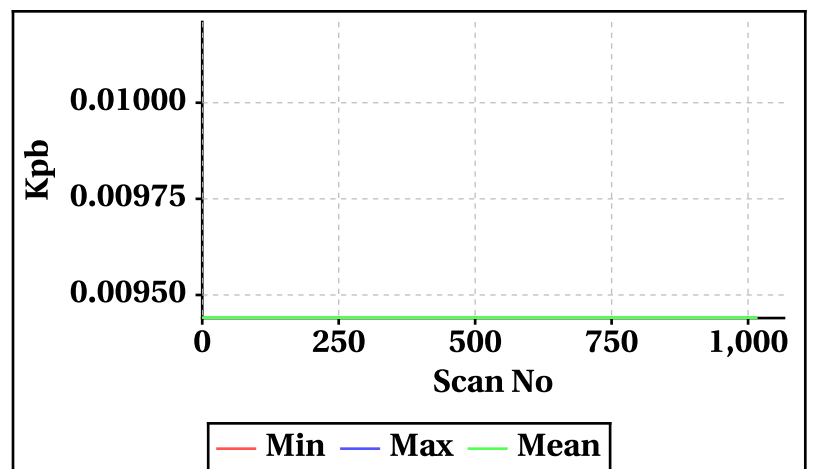
Outer Beam(VV)



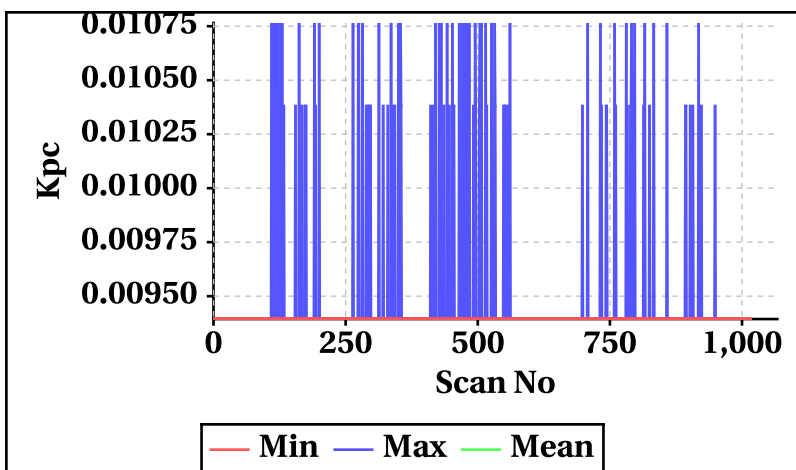
Inner Beam(HH)



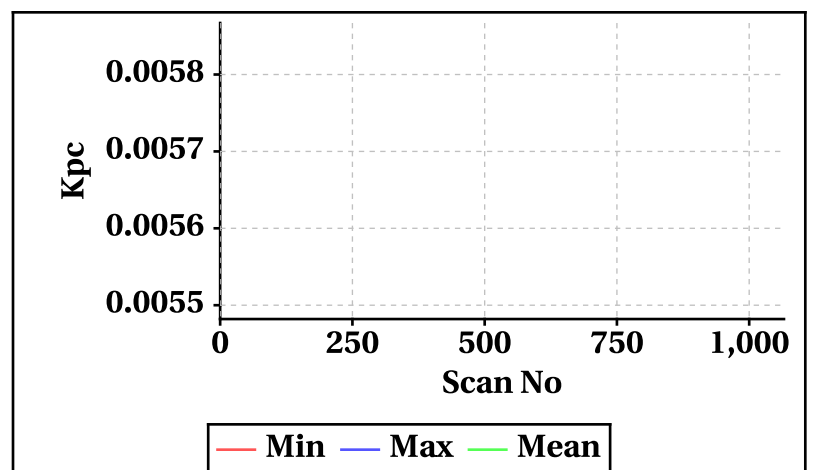
Outer Beam(VV)



Inner Beam(HH)

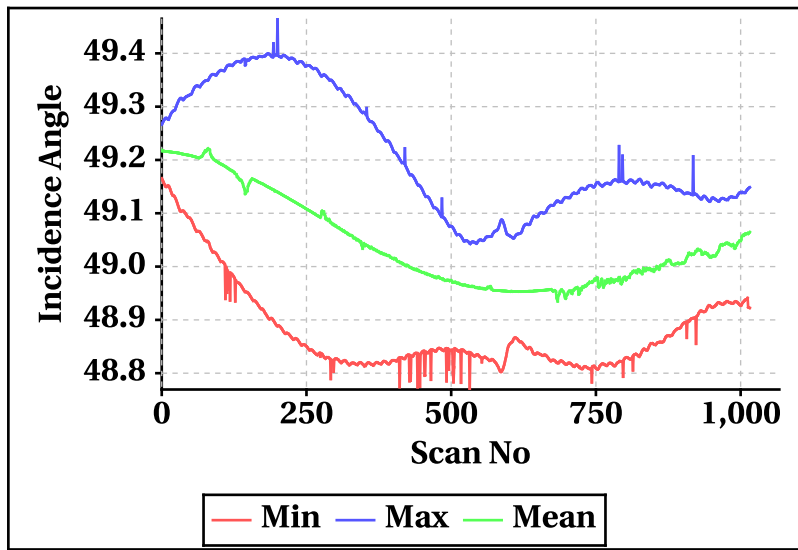


Outer Beam(VV)

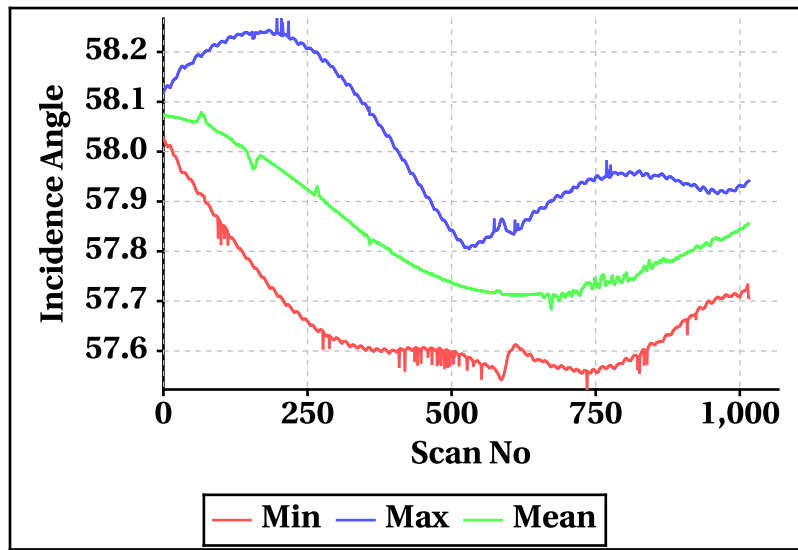


Orbit-wise behaviour of Incidence, Azimuth, Range, X-Factor

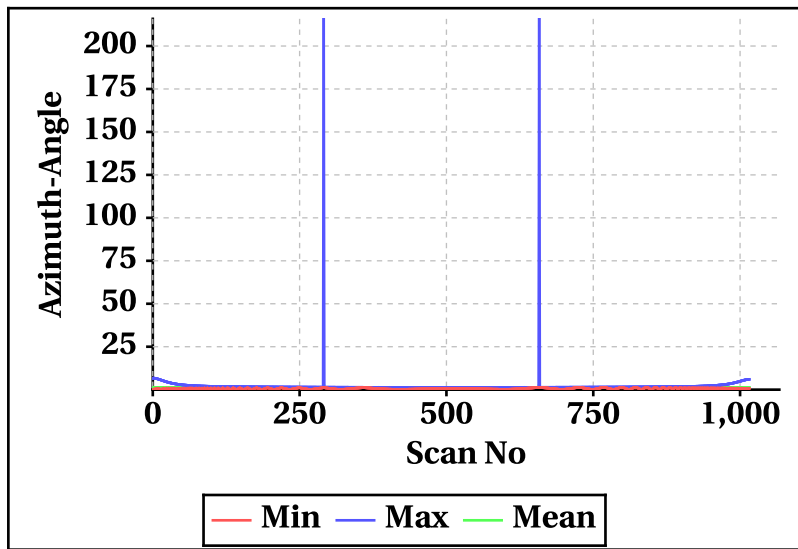
Inner Beam (HH)



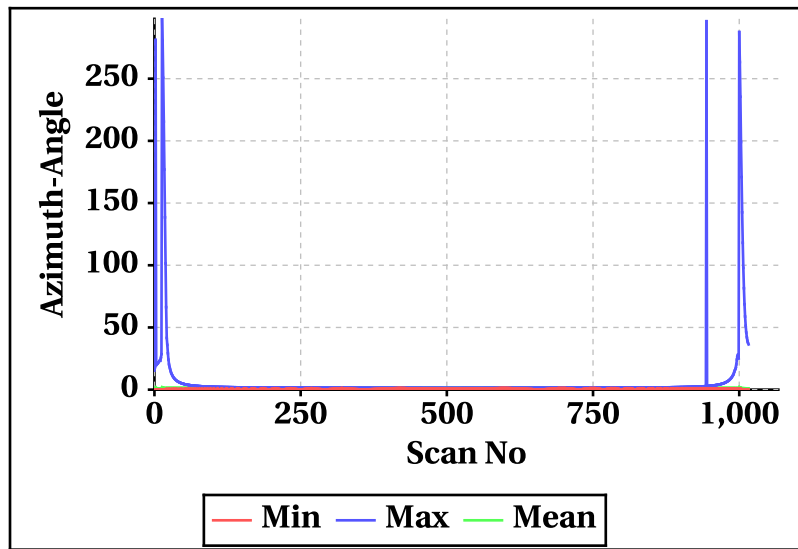
Outer Beam(VV)



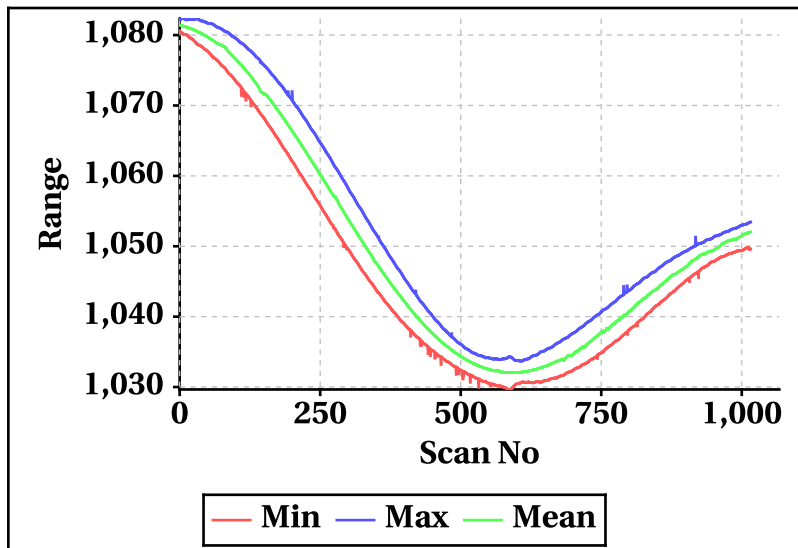
Inner Beam (HH)



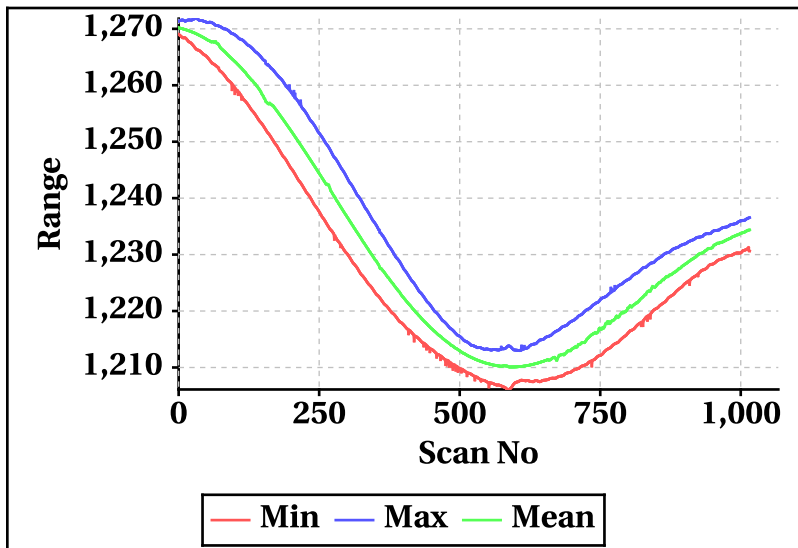
Outer Beam(VV)



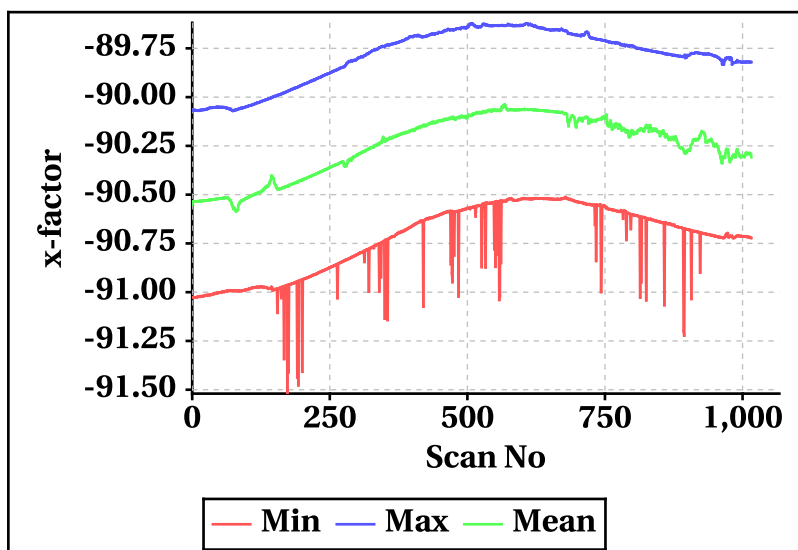
Inner Beam (HH)



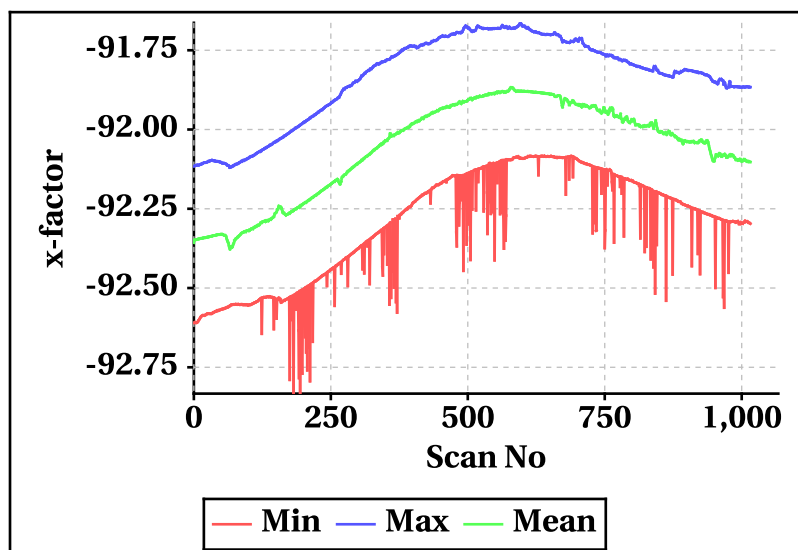
Outer Beam(VV)



Inner Beam (HH)



Outer Beam(VV)

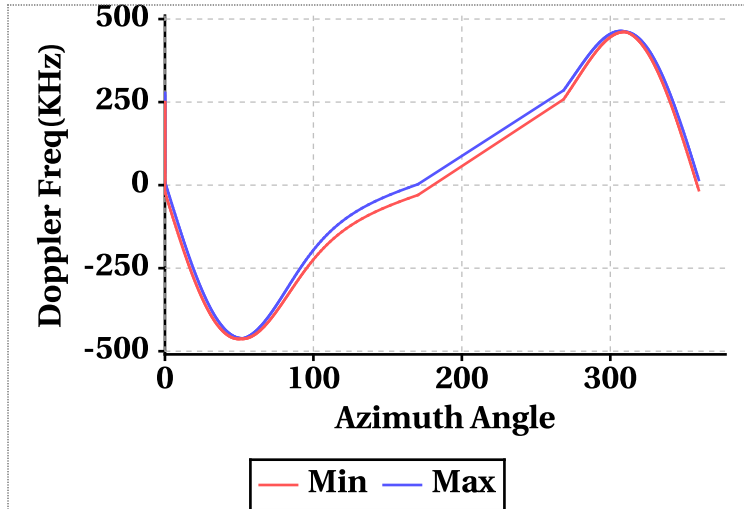


Doppler Frequency Variation

Doppler Frequency(KHz) variation statistics Over the half Orbit

	Inner Beam (HH)	Outer Beam (VV)
Min	-463.20	-519.20
Max	463.86	519.74

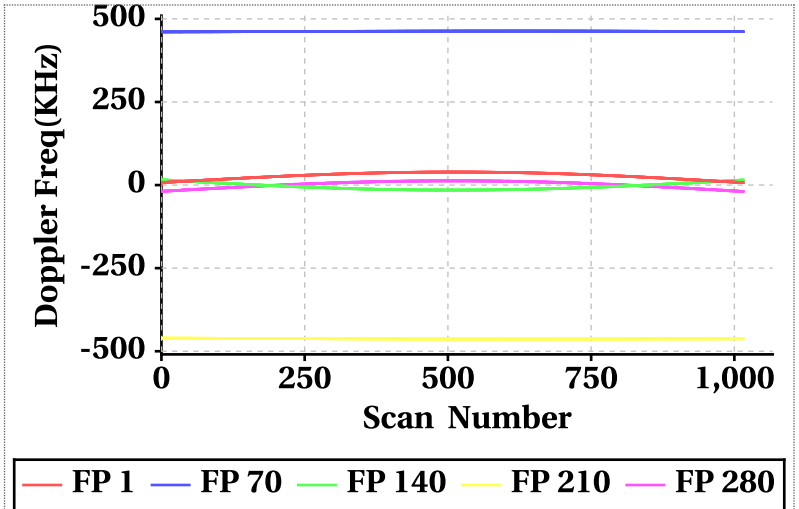
Footprint wise Doppler frequency variation Inner Beam (HH)



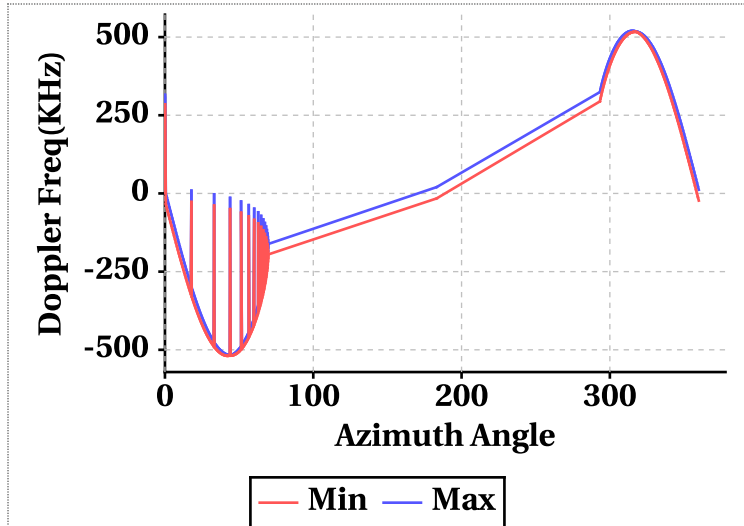
Doppler Frequency(KHz) variation

Doppler_FP	Inner Beam (HH)			Outer Beam (VV)		
	Min	Max	Mean	Min	Max	Mean
Doppler_1	0.00	39.20	27.63	-19.16	38.20	25.29
Doppler_70	460.98	463.42	462.52	516.50	519.50	518.43
Doppler_140	-15.14	15.74	-3.96	-22.90	11.80	-10.33
Doppler_210	-463.14	-460.64	-462.44	-519.00	-516.50	-518.29
Doppler_280	-19.48	12.94	1.21	-15.82	20.30	7.20

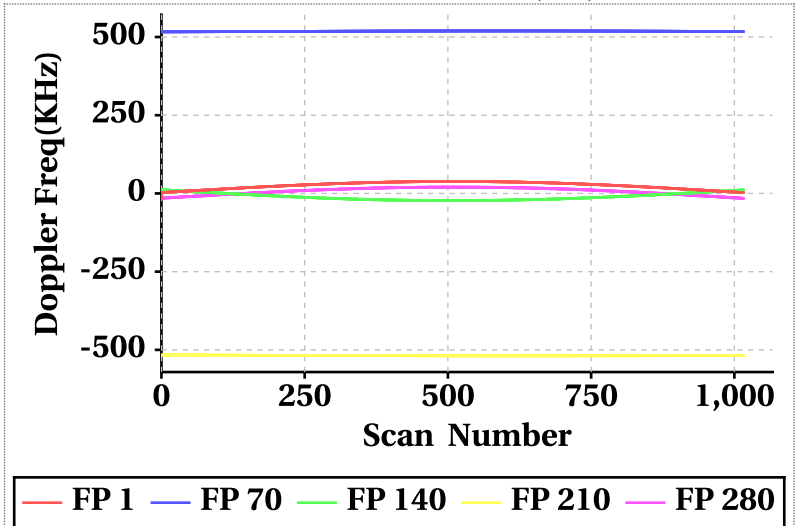
Doppler frequency variation at footprints: 1, 70, 140, 210 & 280 Inner Beam (HH)



Footprint wise Doppler frequency variation Outer Beam (VV)

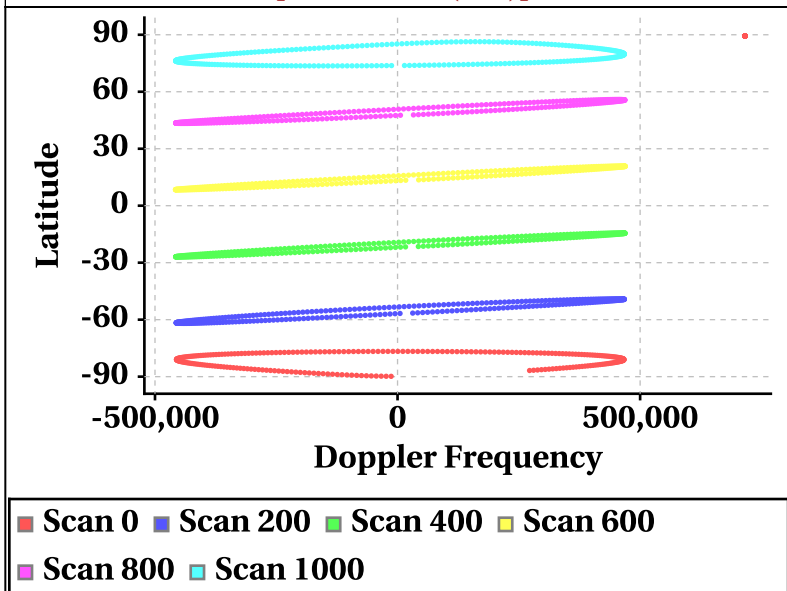


Doppler frequency variation at footprints: 1, 70, 140, 210 & 280 Outer Beam (VV)

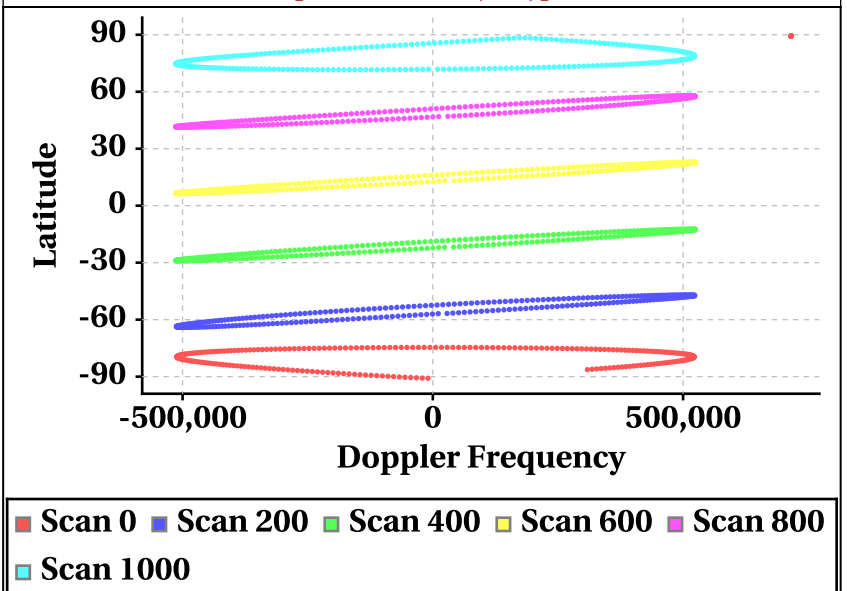


Latitude Vs Doppler Frequency

Doppler Frequency at Scan Interval of 200 [Inner Beam(HH)]



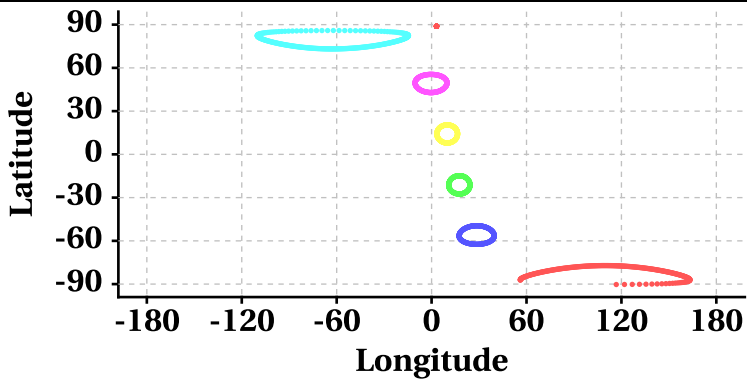
Doppler Frequency at Scan Interval of 200 [Outer Beam(VV)]



Parameter as a function of Latitude

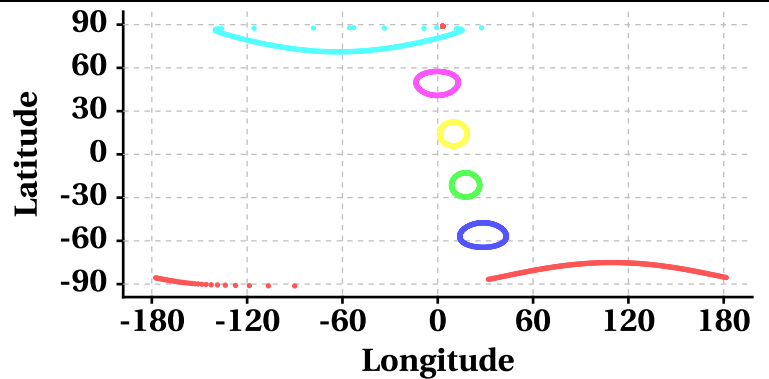
Latitude Vs Longitude

Scan Trace [Inner Beam(HH)]



Scan 0 Scan 200 Scan 400 Scan 600
Scan 800 Scan 1000

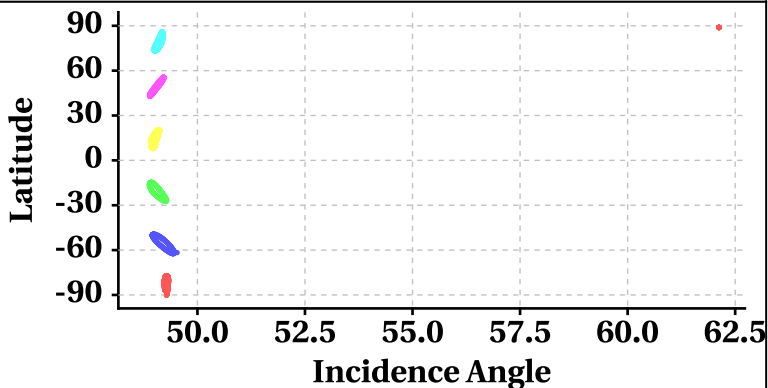
Scan Trace [Outer Beam (VV)]



Scan 0 Scan 200 Scan 400 Scan 600
Scan 800 Scan 1000

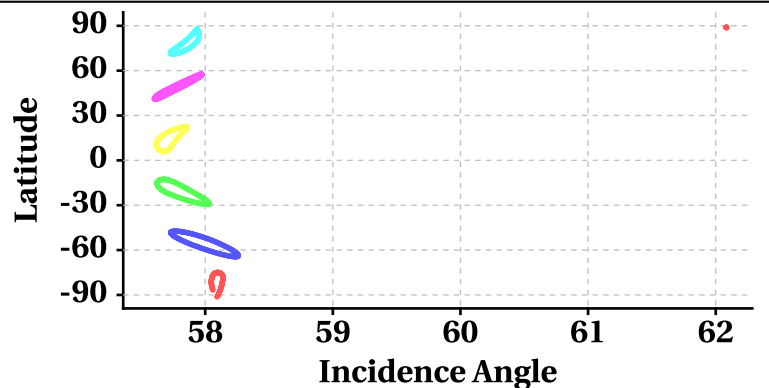
Latitude Vs Incidence Angle

Incidence Angle at Scan Interval of 200 [Inner Beam(HH)]



Scan 0 Scan 200 Scan 400 Scan 600
Scan 800 Scan 1000

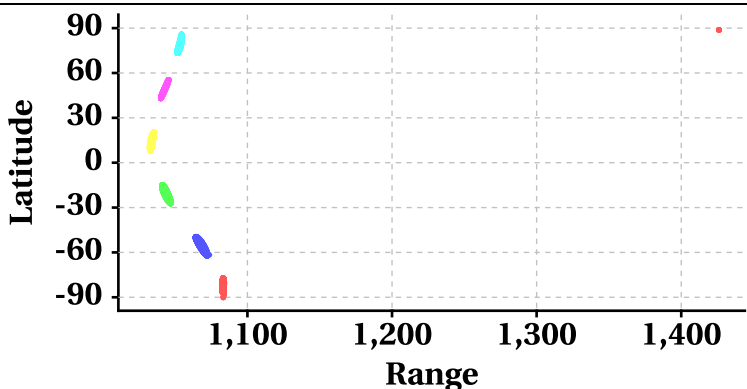
Incidence Angle at Scan Interval of 200 [Outer Beam (VV)]



Scan 0 Scan 200 Scan 400 Scan 600
Scan 800 Scan 1000

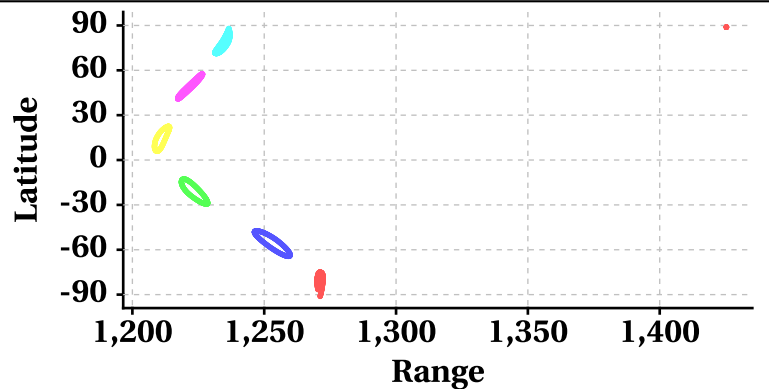
Latitude Vs Range

Range at Scan Interval of 200 [Inner Beam(HH)]



Scan 0 Scan 200 Scan 400 Scan 600
Scan 800 Scan 1000

Range at Scan Interval of 200 [Outer Beam(VV)]



Scan 0 Scan 200 Scan 400 Scan 600
Scan 800 Scan 1000



Variation in Orbit and Attitude Parameters

