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)

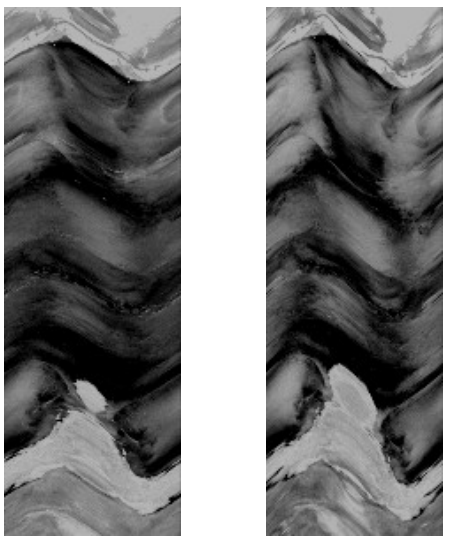
L1B Parameter as a function of Latitude

Half Orbit OAT Behaviour

Satellite Id	ScatSat-1	**Start Orbit**	3291	**Total Scans**	1000
Sensor Name	Scatterometer	**End Orbit**	3292	**No of Inner FootPrints**	281
Processor Version	v1.1.2	**Rev. Number**	03291_03292	**No Of Outer FootPrints**	282
Half Orbit Direction	SN	**Data Production Date**	11-05-2017	**No. Of Inner Slices**	9
Equator Crossing Date	11-05-2017	**Equator Crossing Time**	05:02:13.000	**No Of Outer Slices**	14

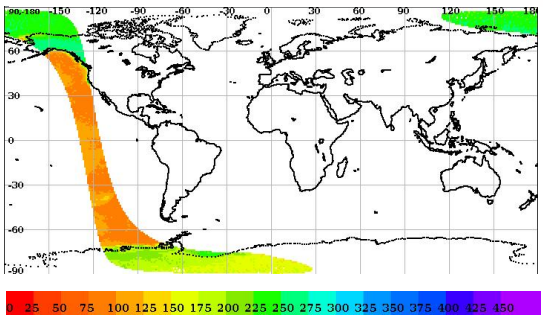
Image Snapshot for Inner & Outer Beam

Inner (HH) **Outer (VV)**

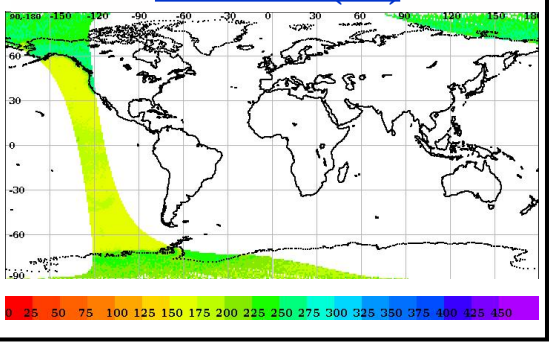


Brightness Temprature(k) Footprint trace

Inner Beam (HH)

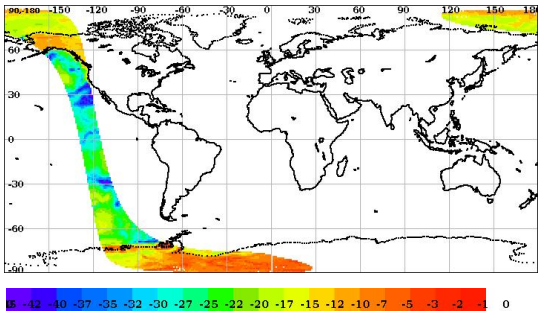


Outer Beam (VV)

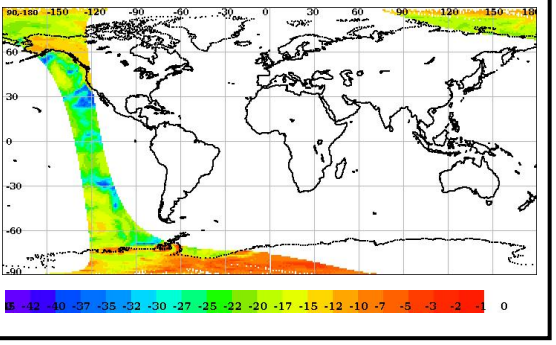


Sigma0(dB) Footprint trace

Inner Beam (HH)



Outer Beam (VV)



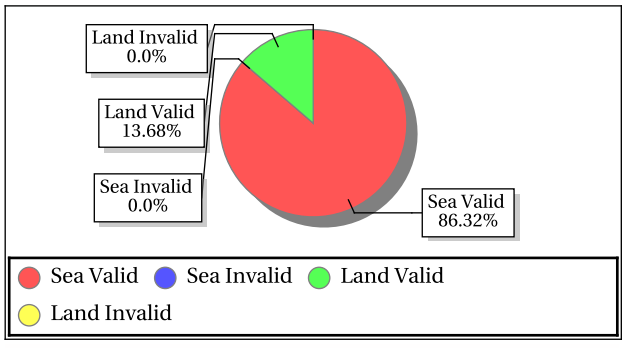
Invalid and Poor Sigma-0 Quality Flag Statistics for Inner/Outer Slices*

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

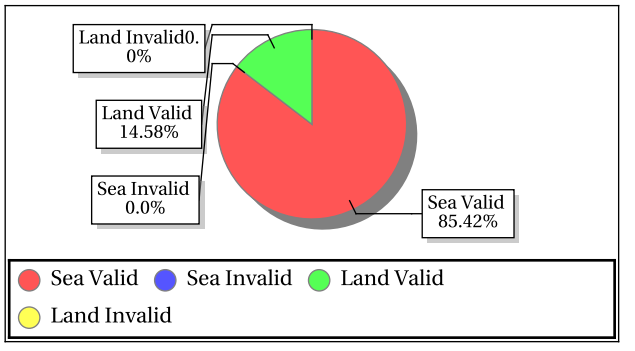
***DP Format Document**

Sigma-0 Quality Flag Statistics for Inner/Outer Footprints

Inner Beam (HH)



Outer Beam (VV)



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	0.10	259.94	0.35	3.387	0.10	232.76	0.27	2.308	0.10	0.11	0.10	0.000	0.10	0.11	0.10	0.000
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	0.02	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
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	-34.88	25.39	3.38	0.231	-34.40	26.60	5.57	0.290	8.44	28.51	17.38	13.274	8.40	29.82	17.35	8.090

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	0.08	203.43	0.30	2.656	0.08	182.18	0.26	2.295	0.08	0.12	0.09	0.000	0.08	0.12	0.09	0.000
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	0.00	0.01	0.00	0.000	0.00	0.01	0.00	0.000	0.00	0.00	0.00	0.000	0.00	0.00	0.00	0.000
SNR	-34.70	19.98	2.26	0.000	-34.22	21.16	3.25	0.000	2.08	22.38	12.34	0.059	2.05	23.80	11.59	0.277

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)

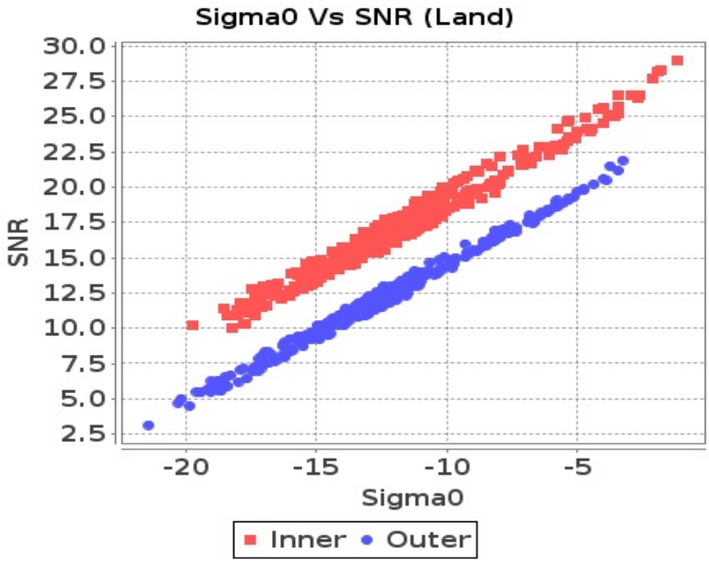
	Inner Beam (HH)				Outer Beam (VV)			
	Min	Max	Mean	Bad Occ. (%)	Min	Max	Mean	Bad Occ. (%)
Incidence Angle (deg)	48.70	49.39	49.05	0.000	57.50	58.29	57.99	0.000
Azimuth Diff. (deg)	0.0026	1.80	1.10	0.138	0.0026	1.98	1.09	0.205
Range(Km)	1043.93	1073.18	1056.69	0.000	1222.87	1261.95	1242.21	0.000
X Factor(dbm)	-91.91	-89.34	-90.50	0.000	-93.35	-91.83	-92.39	0.000
Across Distance (Km)	15.74	16.24	15.96	0.000	14.39	35.47	21.09	4.000
Along Distance (Km)	19.09	20.41	19.72	0.000	18.94	20.46	19.62	0.000

Parameter Specifications		
Parameter	Min	Max
Inci.(Inner)	47.10	49.90
Inci.(Outer)	57.30	58.90
Azimuth Diff.	0.60	2.00
Range(Inner)	1025.00	1095.70
Range(Outer)	1210.00	1280.00
X-Factor	-100.00	-80.00
Ac.Dist(Inner)	15.00	20.00
Ac.Dist(Outer)	15.00	22.00
Al.Dist(Inner)	15.00	30.00
Al.Dist(Outer)	10.00	30.00

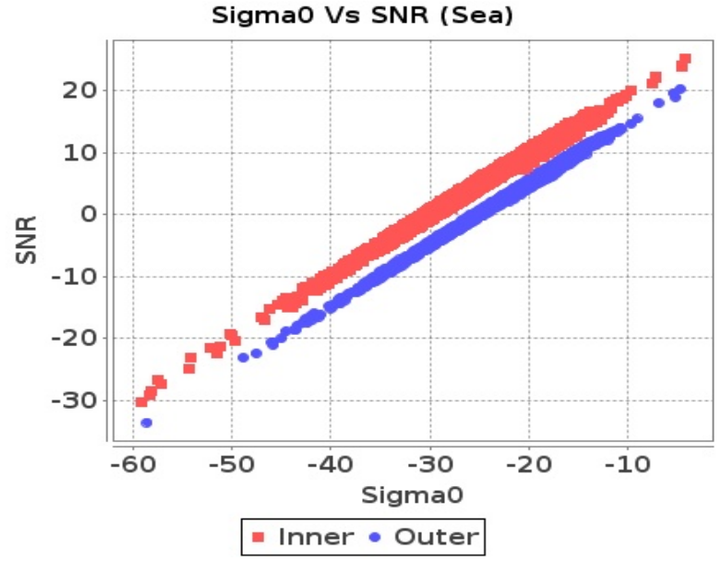
Normal
Deviations
Alarming
High Errors

Sigma0 Behaviour (Sigma0 Vs SNR)

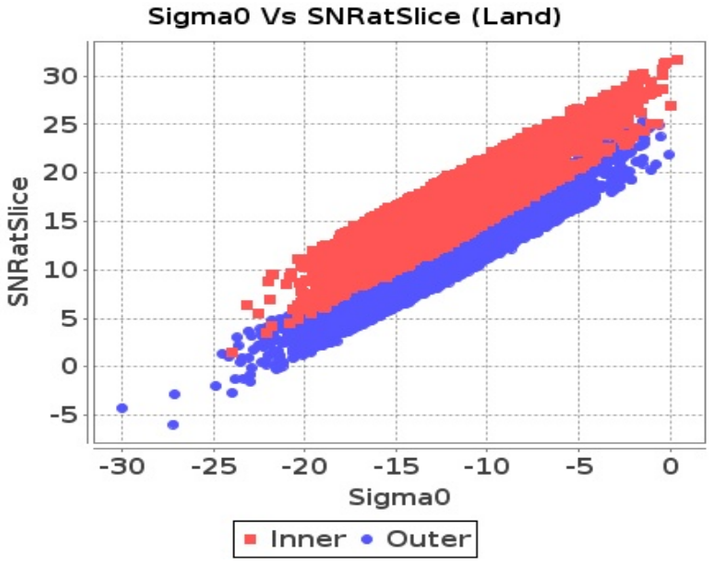
Footprint-Land



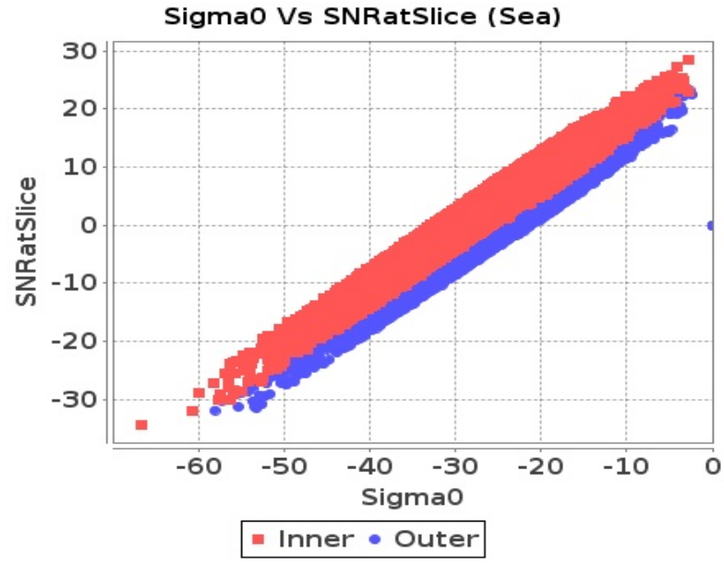
Footprint-Sea



Slice-Land

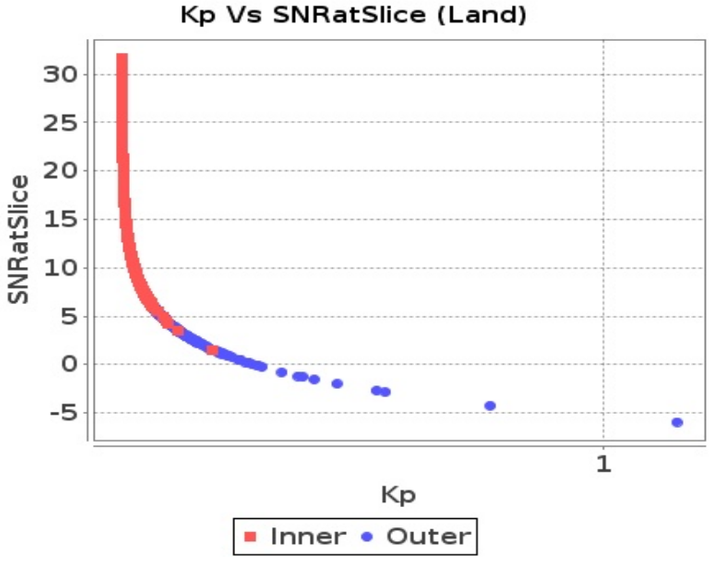


Slice-Sea

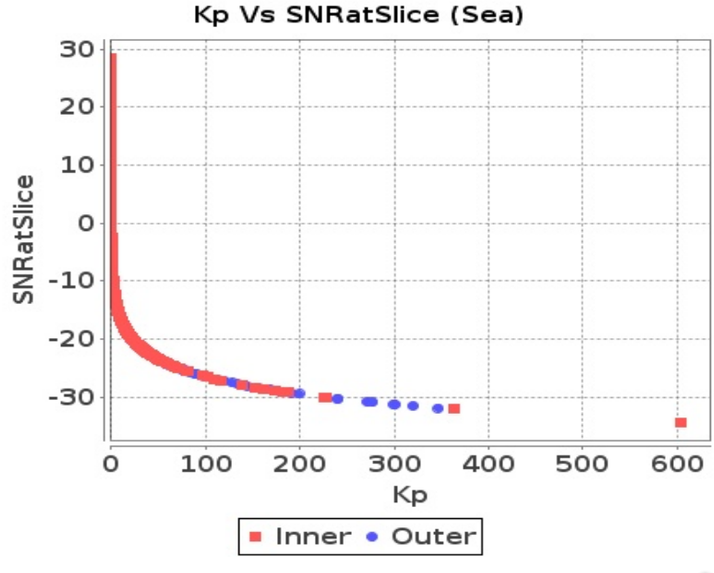


Sigma0 Behaviour (Kp Vs SNR)

Slice

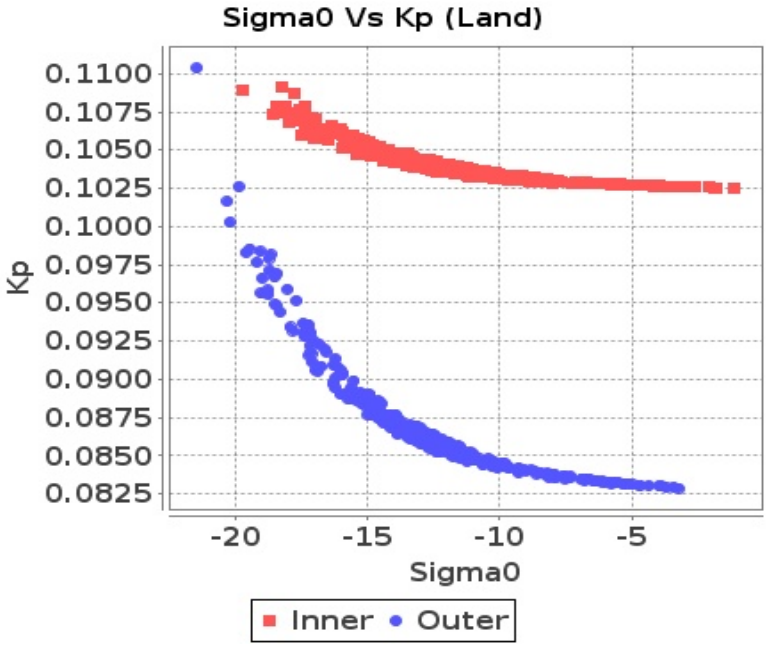


Slice

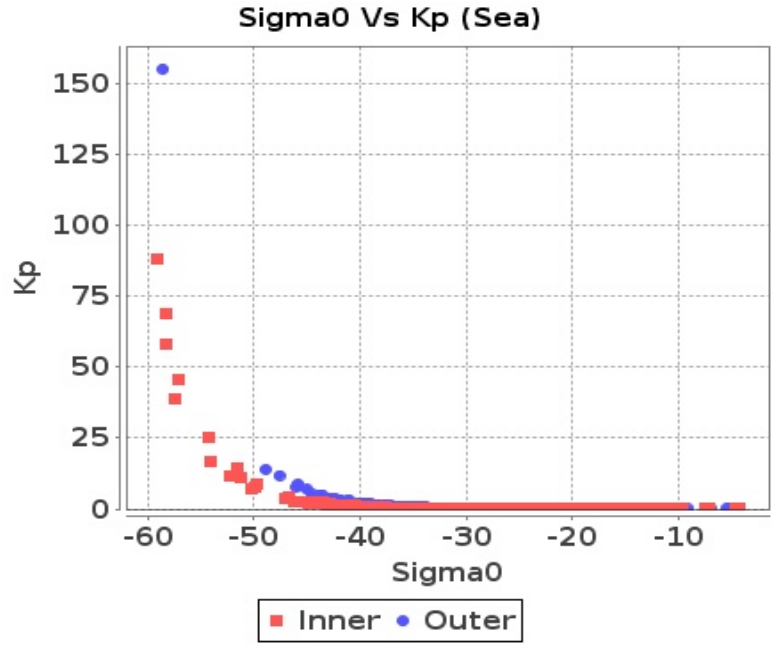


Sigma0 Behaviour(Sigma0 Vs Kp)

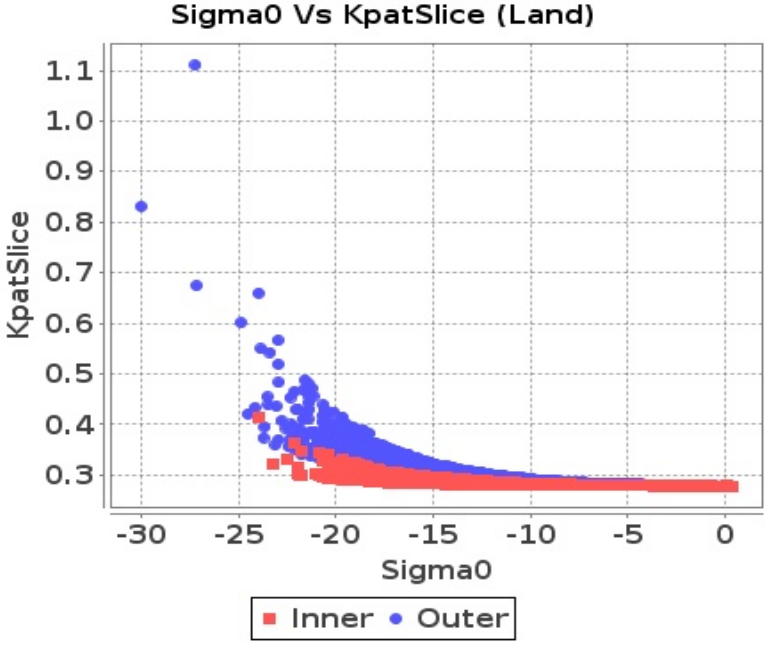
Footprint-Land



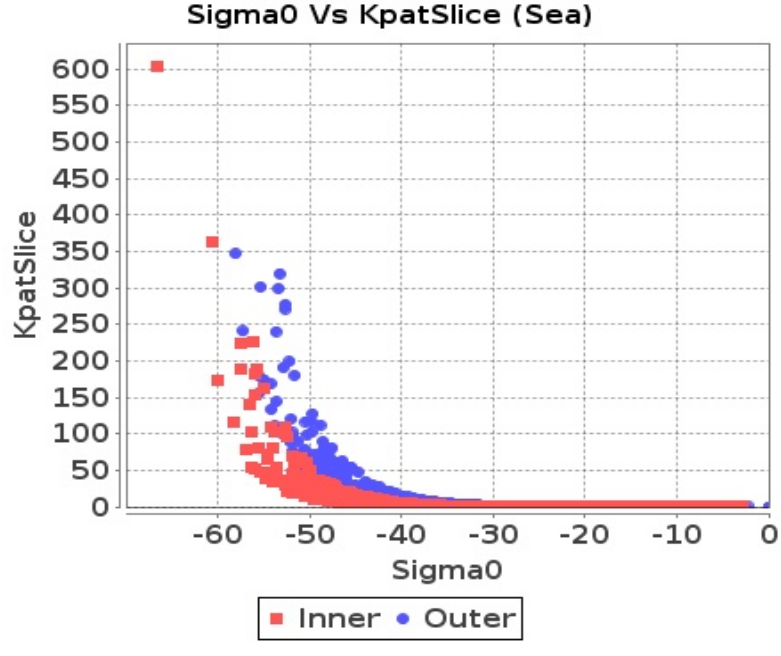
Footprint-Sea



Slice-Land



Slice-Sea

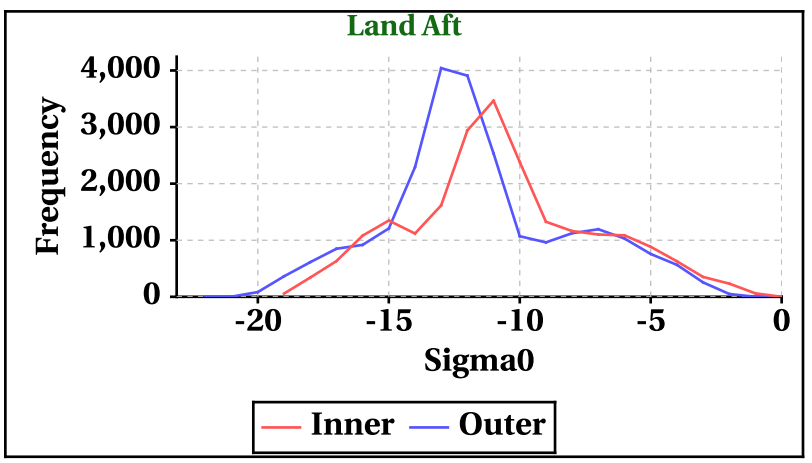


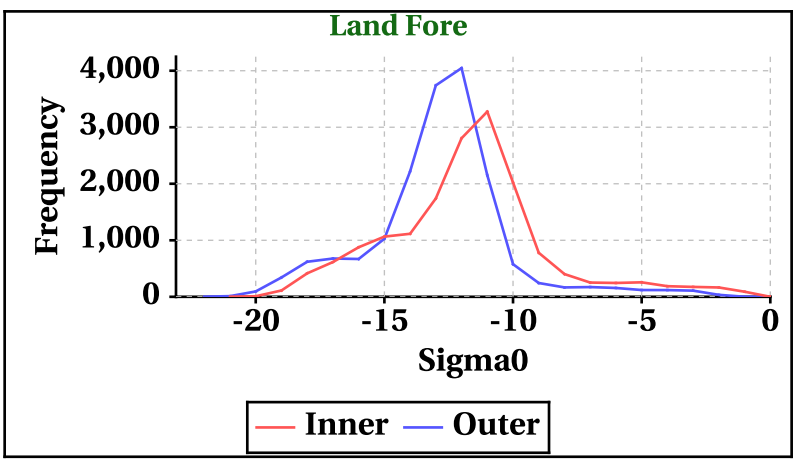
Dynamic Range (Data Histograms)

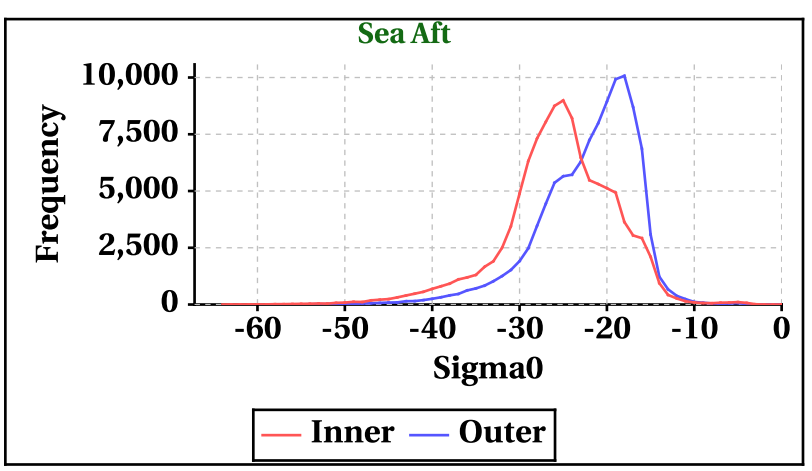
Sigma0(db)

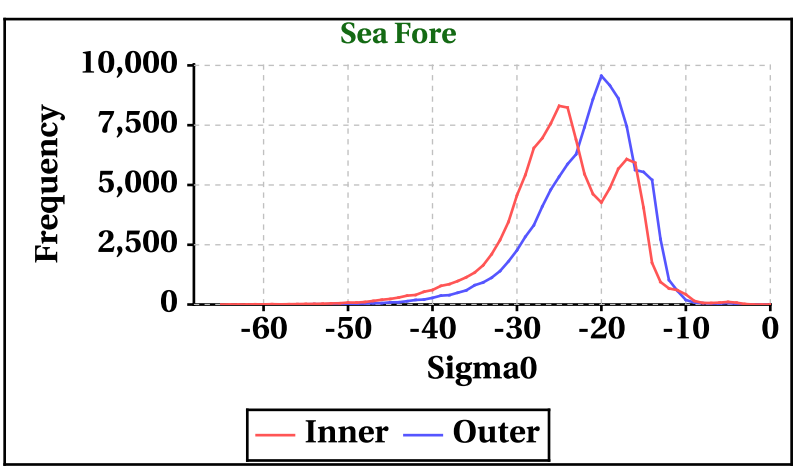
Inner Beam (HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-19	-21	-64	-65
Max	0	0	0	0

Outer Beam (VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-22	-22	-59	-59
Max	0	0	0	0





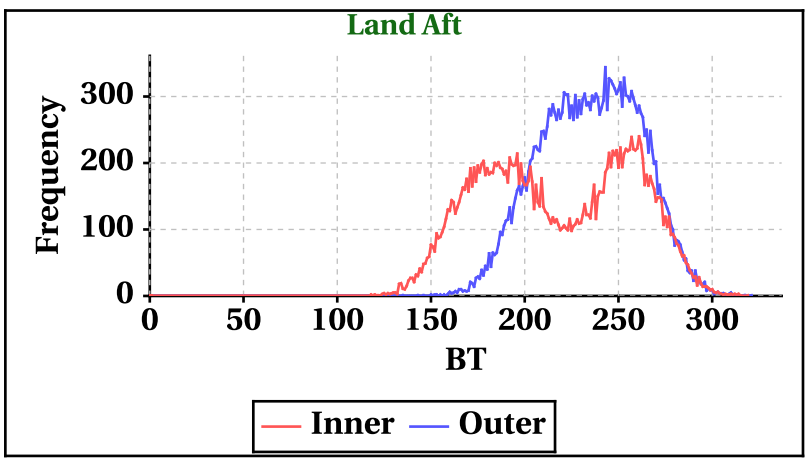


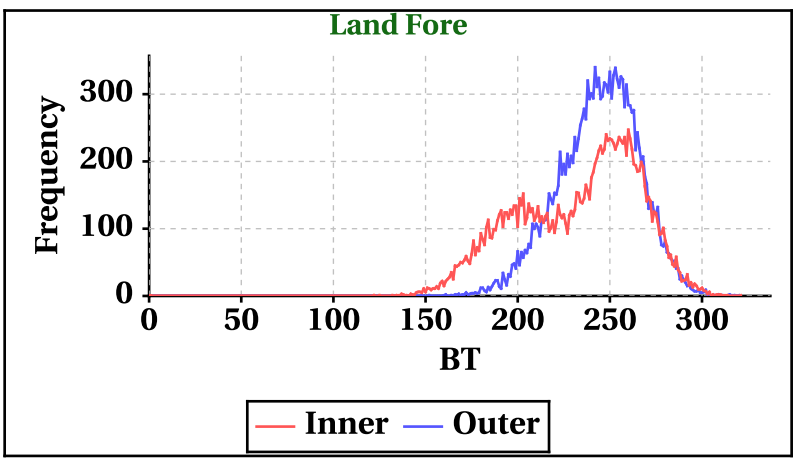


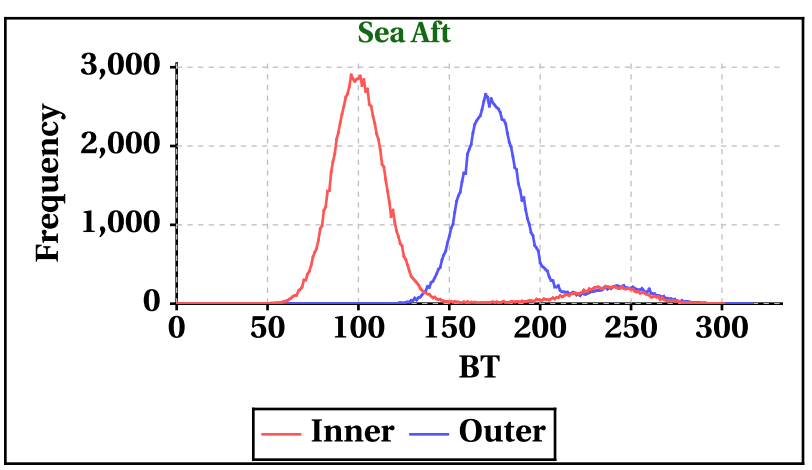
Brightness Temperature(K)

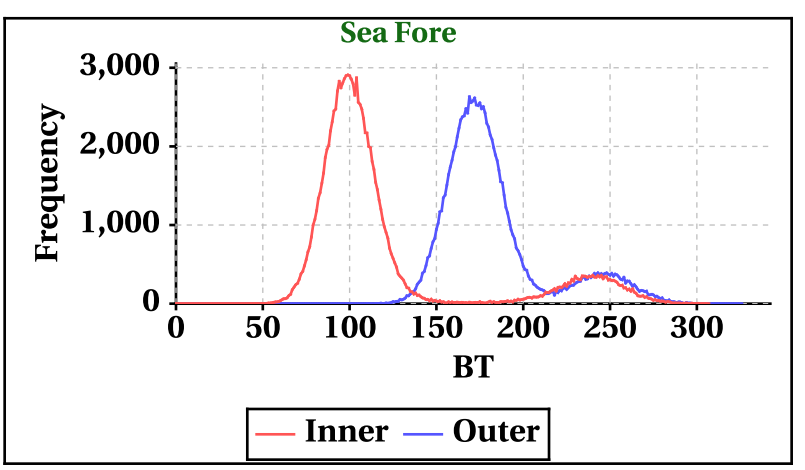
Inner Beam(HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	0	0
Max	319	321	301	307

Outer Beam(VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	0	0
Max	321	320	317	326







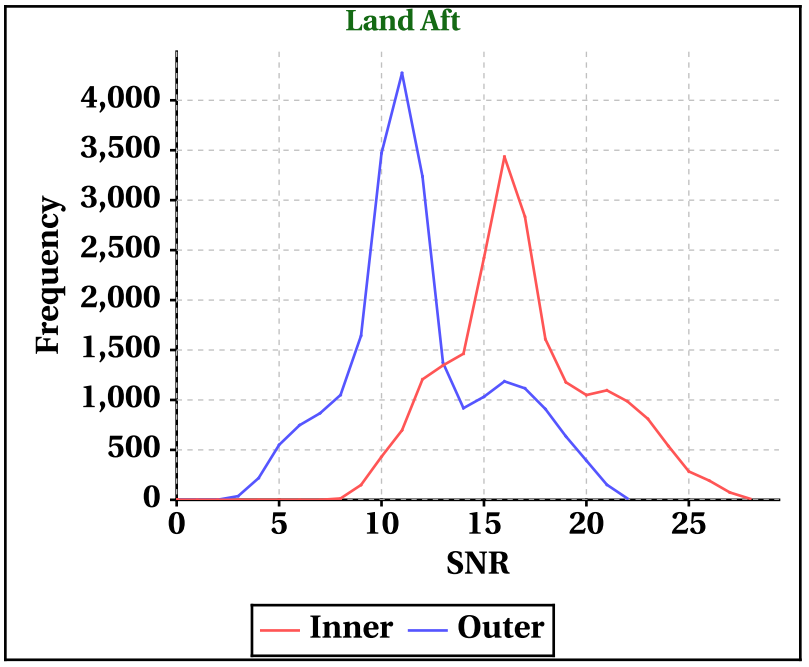


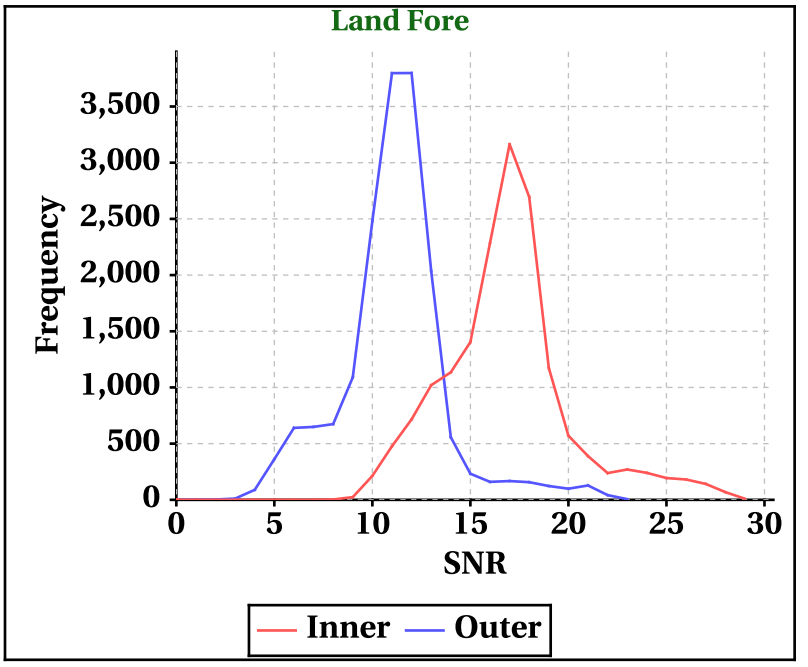
Dynamic Range (Data Histograms)

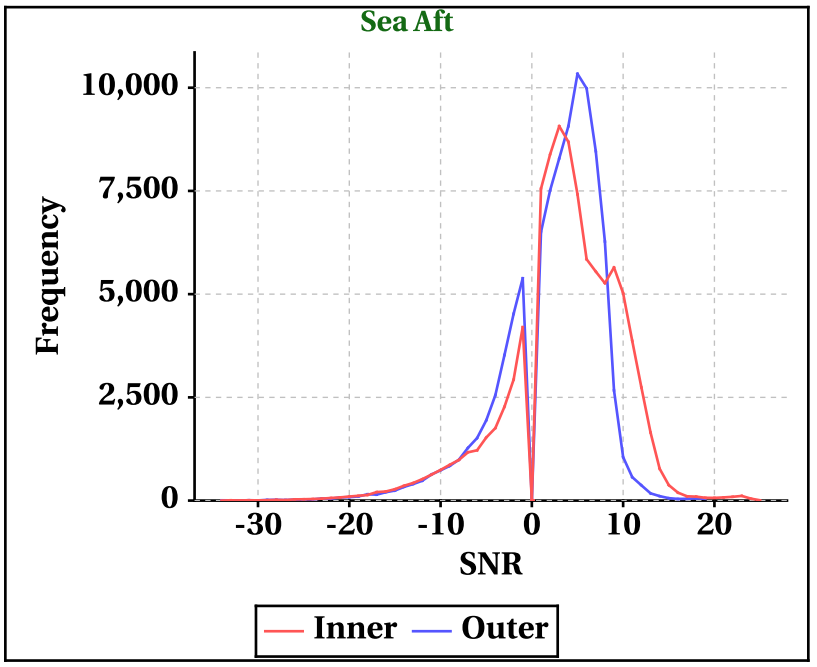
SNR(dBm)

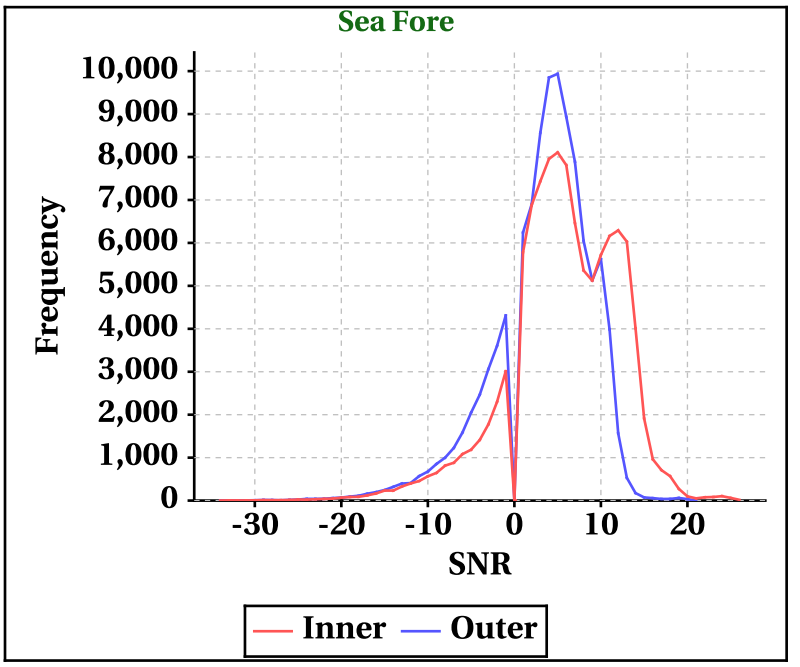
Inner Beam (HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	-34	-34
Max	28	29	25	26

Outer Beam (VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	-34	-34
Max	22	23	19	21



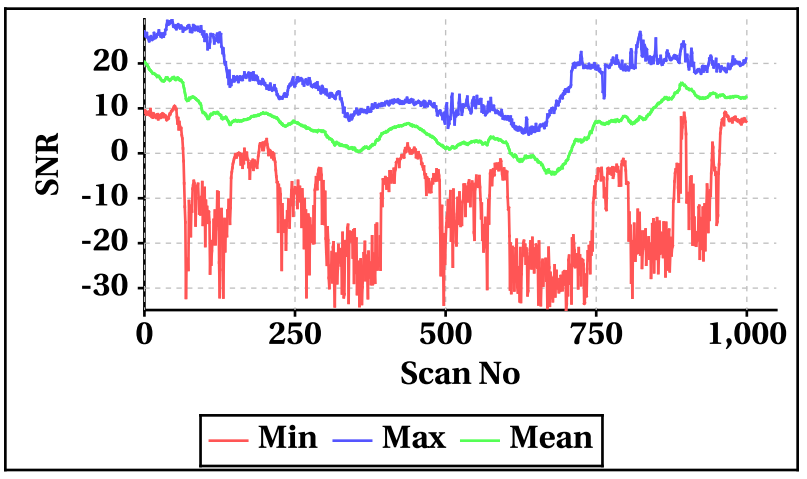




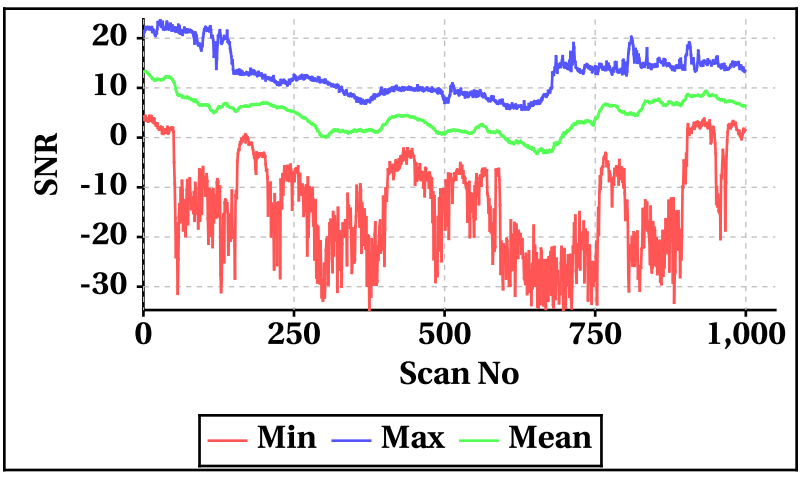


Orbit-wise behaviour of SNR

Inner Beam (HH)

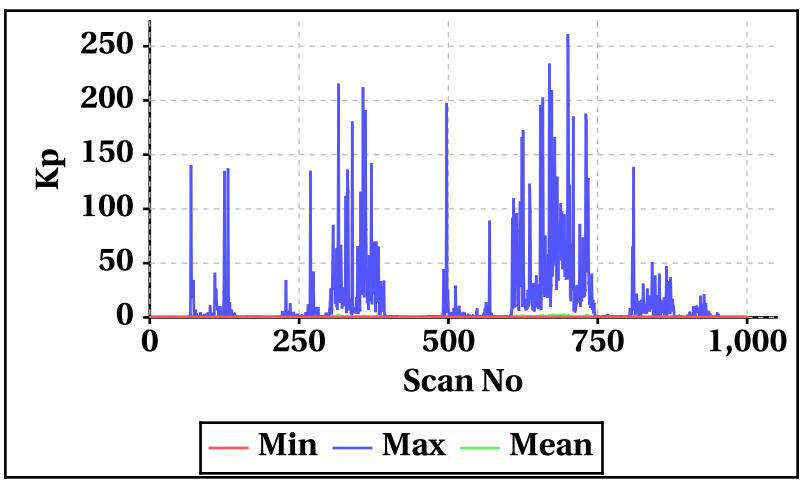


Outer Beam(VV)

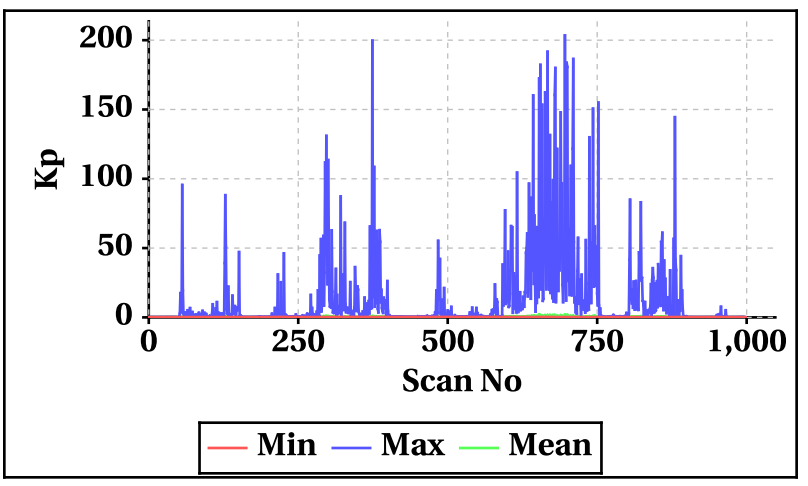


Orbit-wise behaviour of Kp,Kpa,Kpb,Kpc

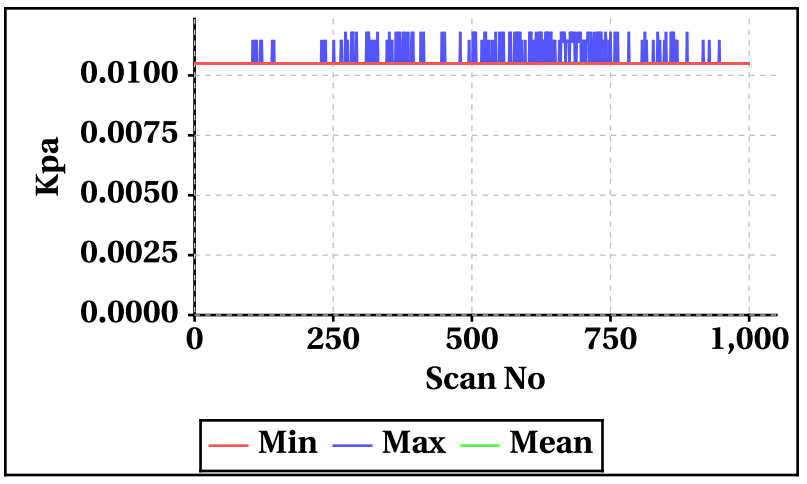
Inner Beam(HH)



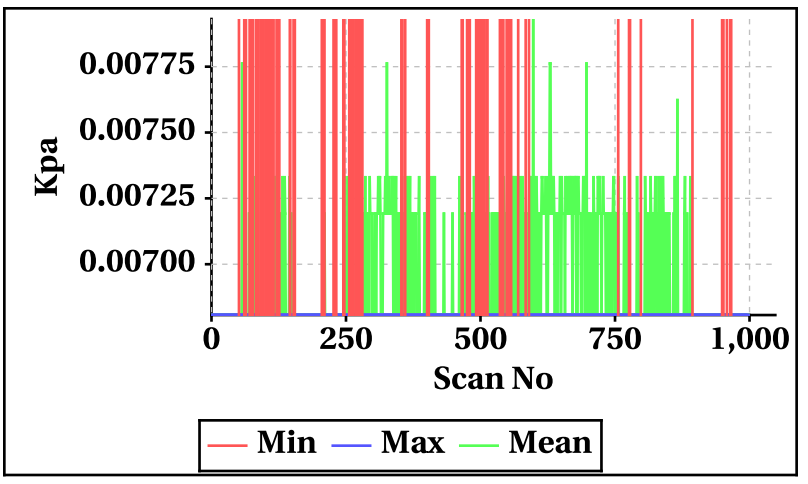
Outer Beam(VV)



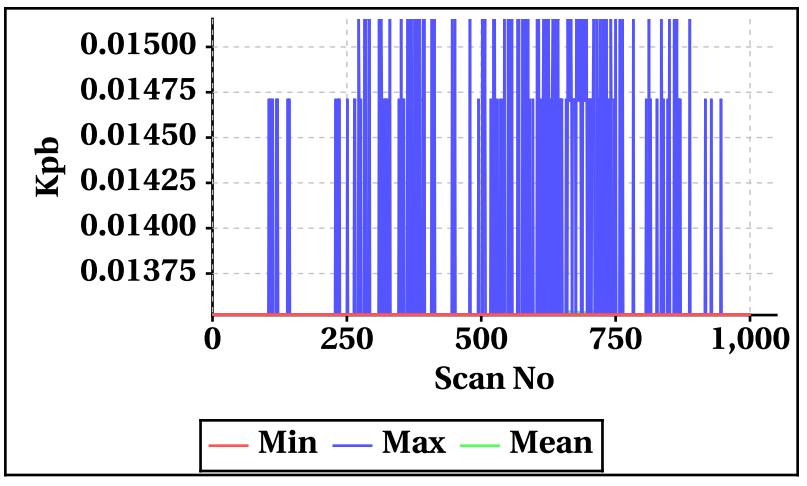
Inner Beam(HH)



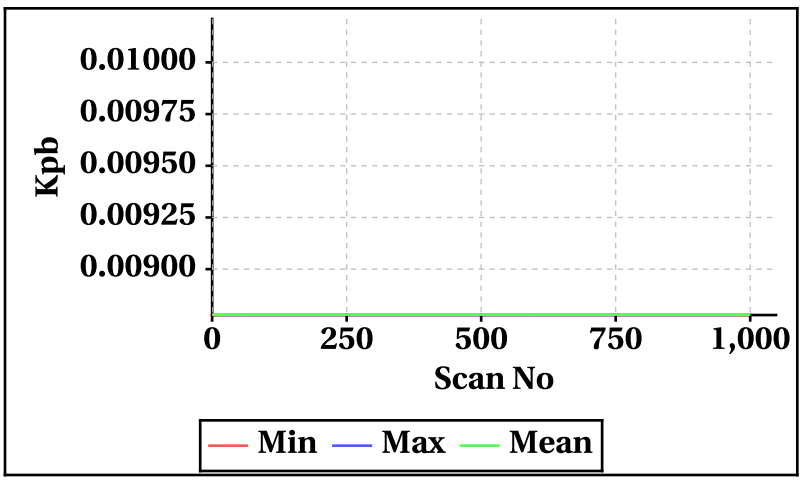
Outer Beam(VV)



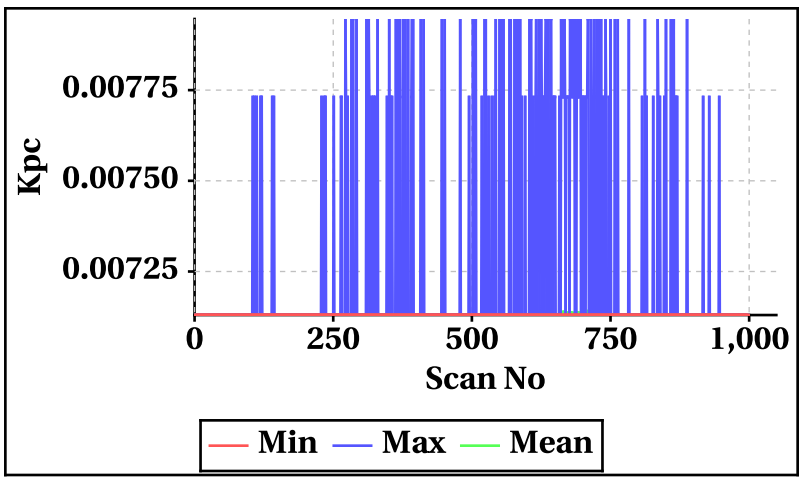
Inner Beam(HH)



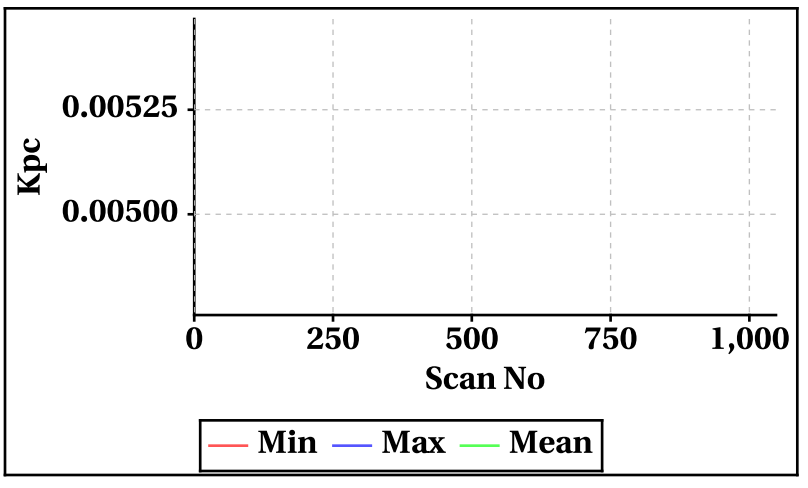
Outer Beam(VV)



Inner Beam(HH)

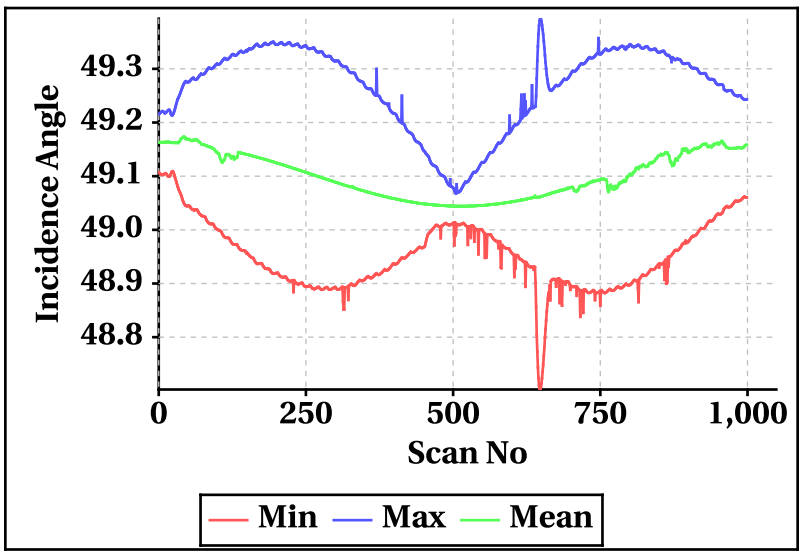


Outer Beam(VV)

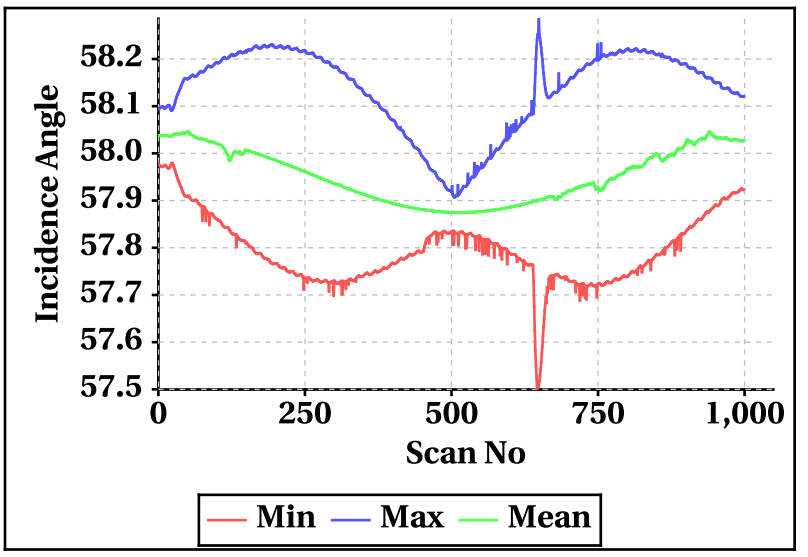


Orbt-wise behaviour of Incidence,Azimuth,Range,X-Factor

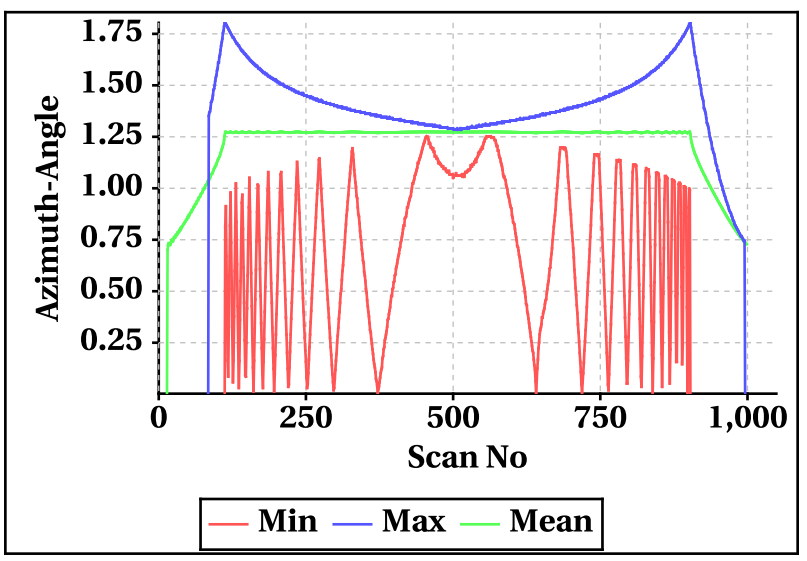
Inner Beam (HH)



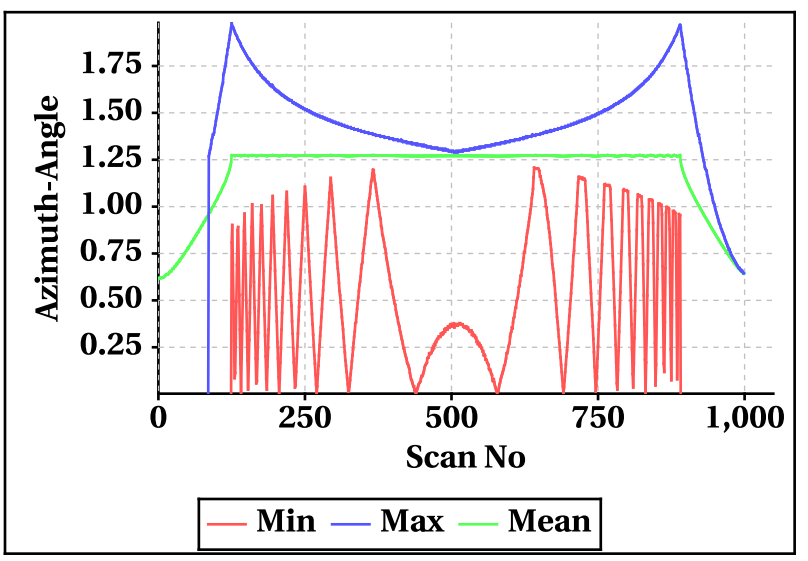
Outer Beam(VV)



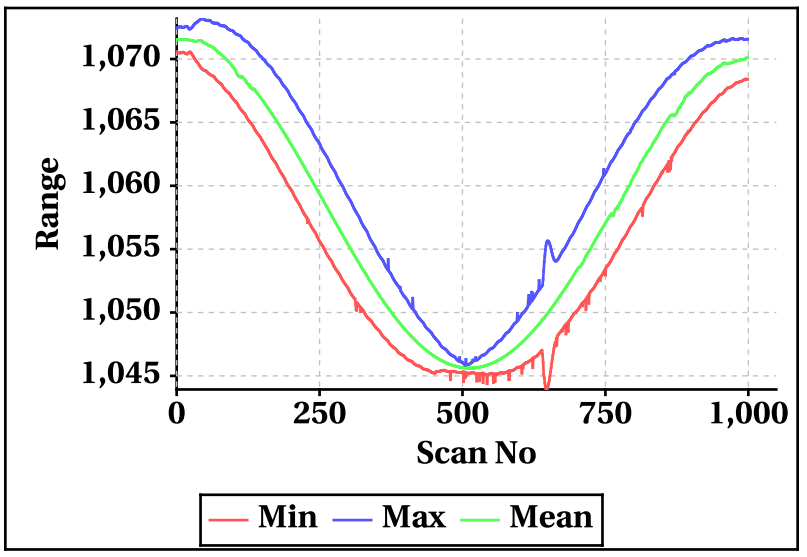
Inner Beam (HH)



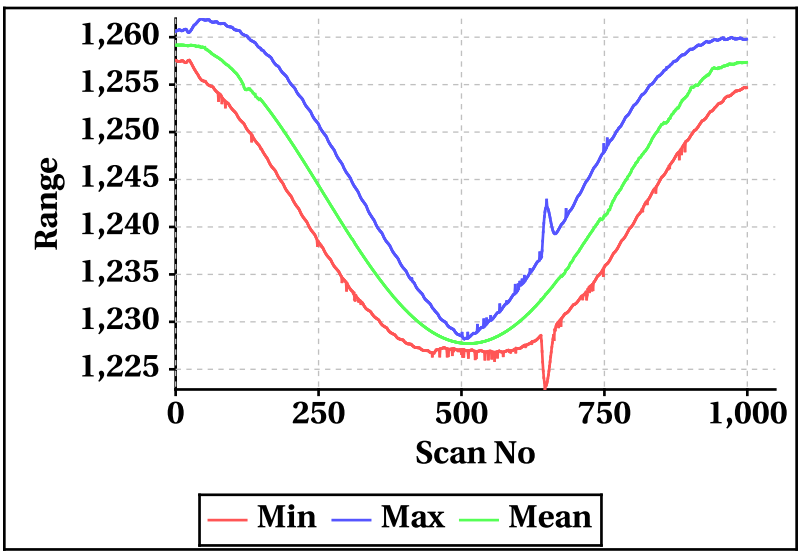
Outer Beam(VV)



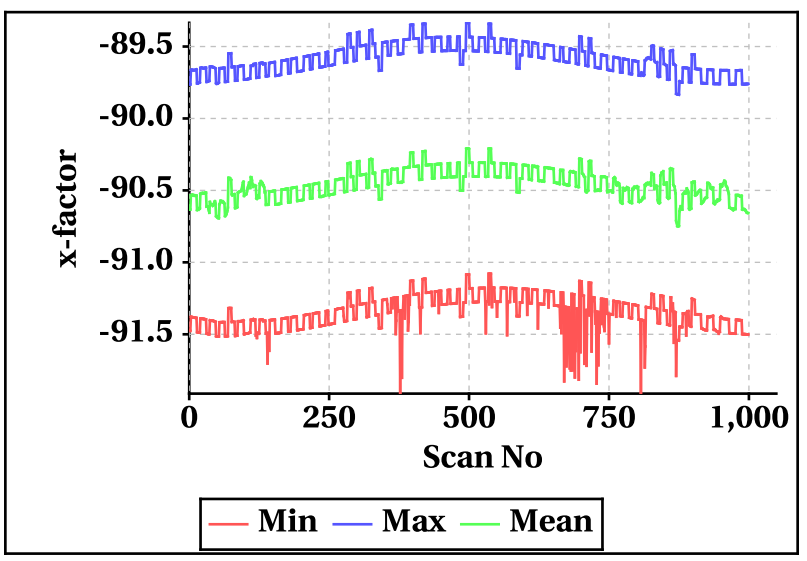
Inner Beam (HH)



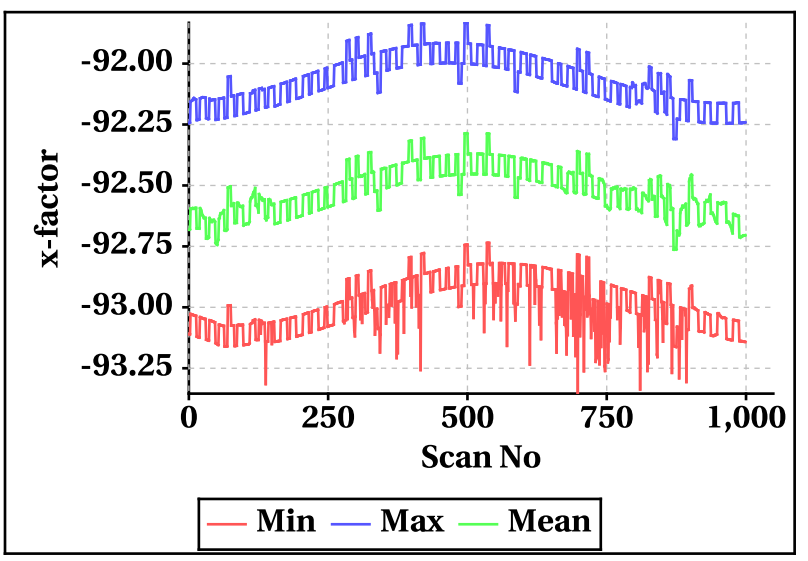
Outer Beam(VV)



Inner Beam (HH)



Outer Beam(VV)



Doppler Frequency Variation

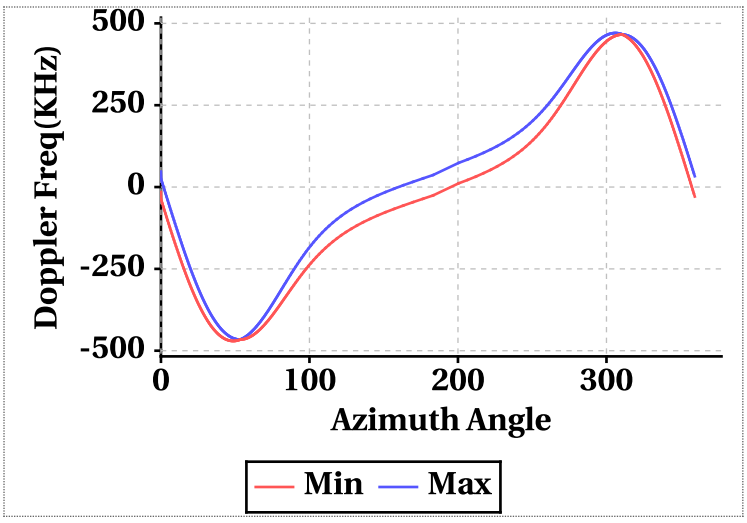
Doppler Frequency(KHz) variation statistics Over the half Orbit

	Inner Beam (HH)	Outer Beam (VV)
Min	-470.28	-527.04
Max	470.40	527.16

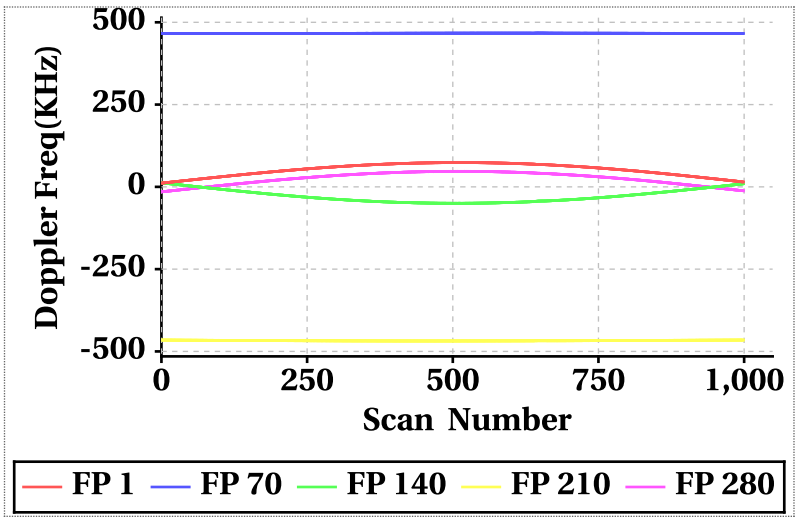
Doppler Frequency(KHz) variation

	Inner Beam (HH)			Outer Beam (VV)		
Doppler_FP	Min	Max	Mean	Min	Max	Mean
Doppler_1	11.30	73.80	51.72	7.52	77.54	52.83
Doppler_70	465.66	467.32	466.47	521.80	524.14	523.12
Doppler_140	-49.98	12.24	-27.92	-62.52	7.24	-37.79
Doppler_210	-468.32	-465.46	-467.20	-524.20	-521.86	-523.26
Doppler_280	-15.22	47.18	25.06	-10.54	59.34	34.57

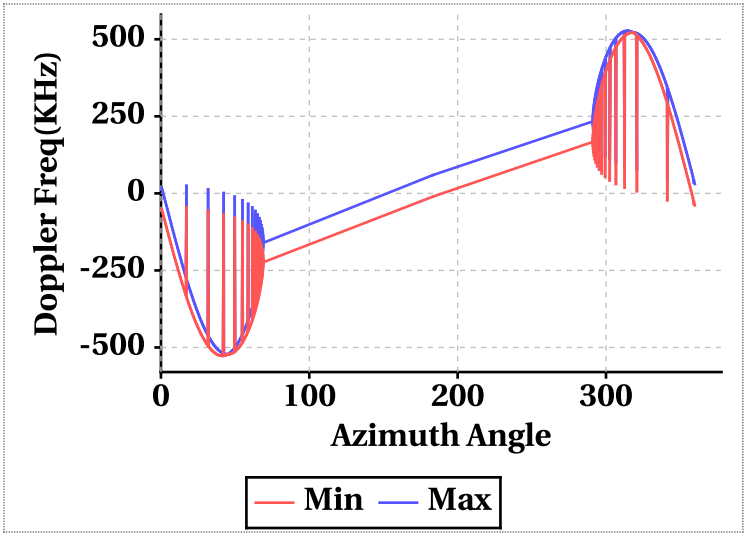
Footprint wise Doopler frequency variation Inner Beam (HH)



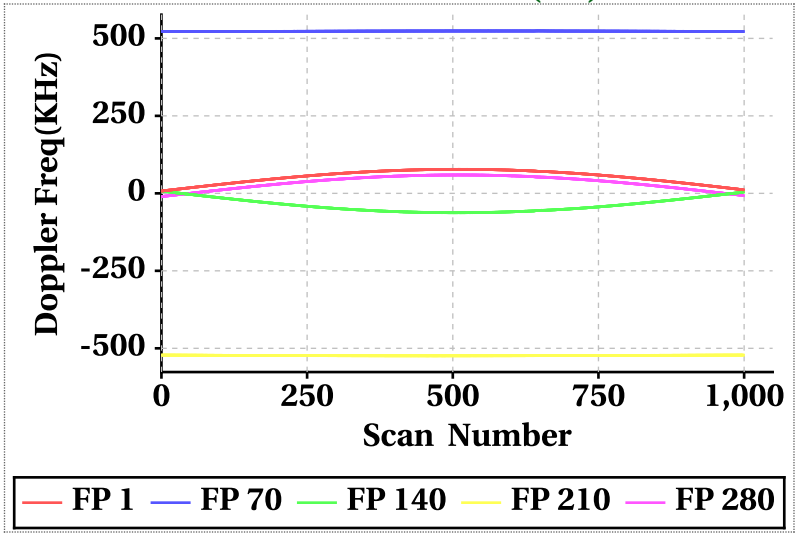
Doppler frequency variation at footprints: 1, 70, 140, 210 & 280 Inner Beam (HH)



Footprint wise Doopler frequency variation Outer Beam (VV)

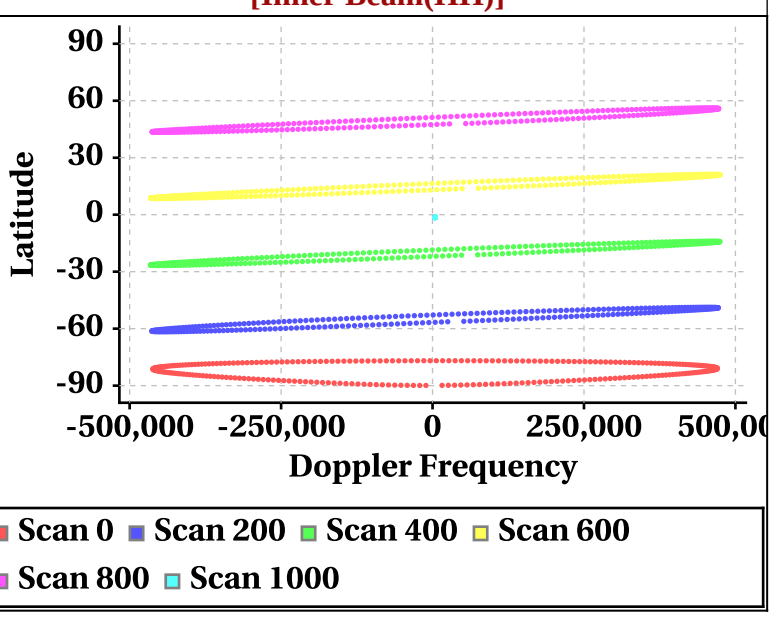


Doppler frequency variation at footprints: 1, 70, 140, 210 & 280 Outer Beam (VV)

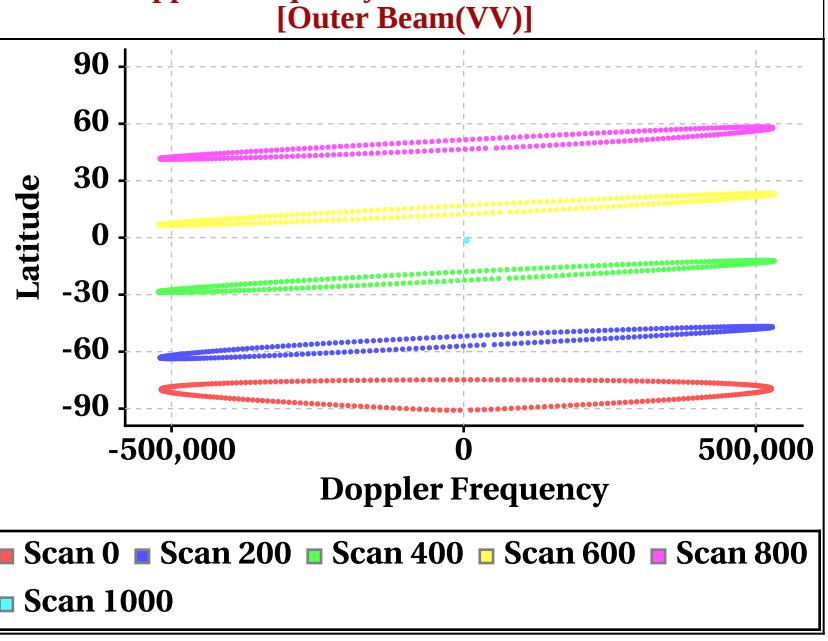


Latitude Vs Doppler Frequency

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



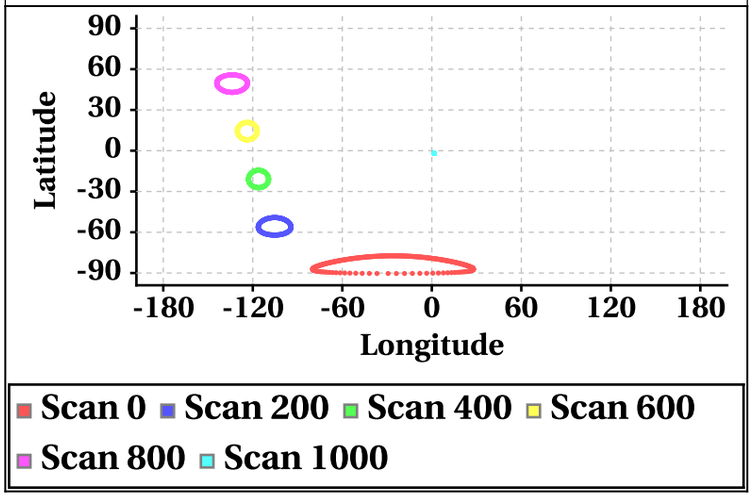
Doppler Frequency at Scan Interval of 200 [Outer Beam(VV)]



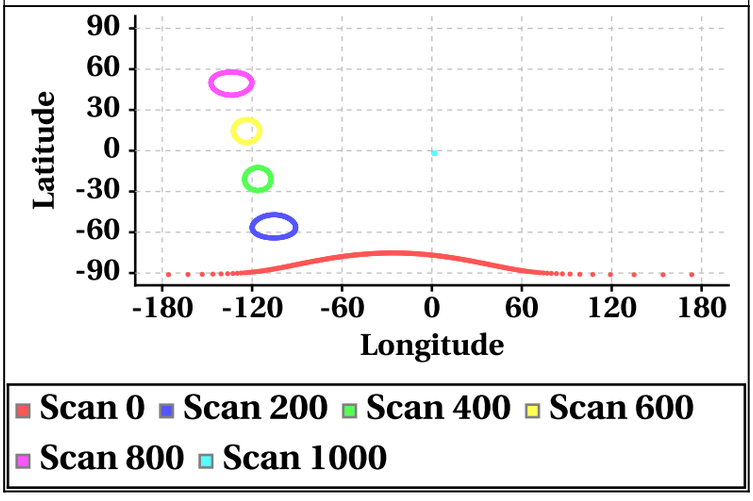
Parameter as a function of Latitude

Latitude Vs Longitude

Scan Trace [Inner Beam(HH)]

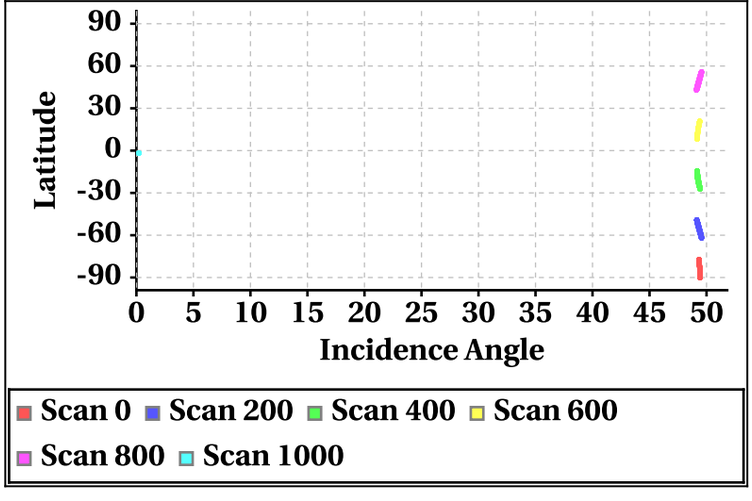


Scan Trace [Outer Beam (VV)]

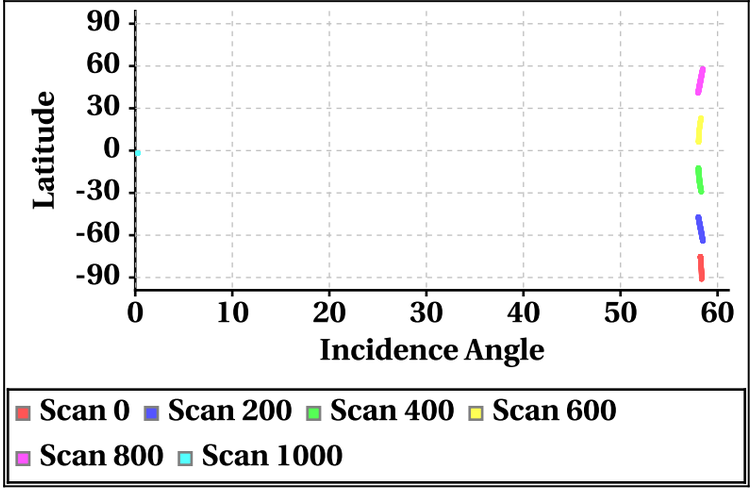


Latitude Vs Incidence Angle

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

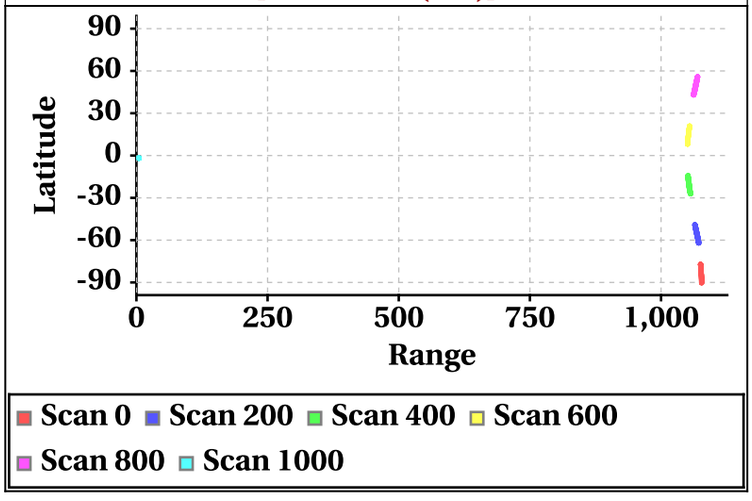


Incidence Angle at Scan Interval of 200 [Outer Beam (VV)]

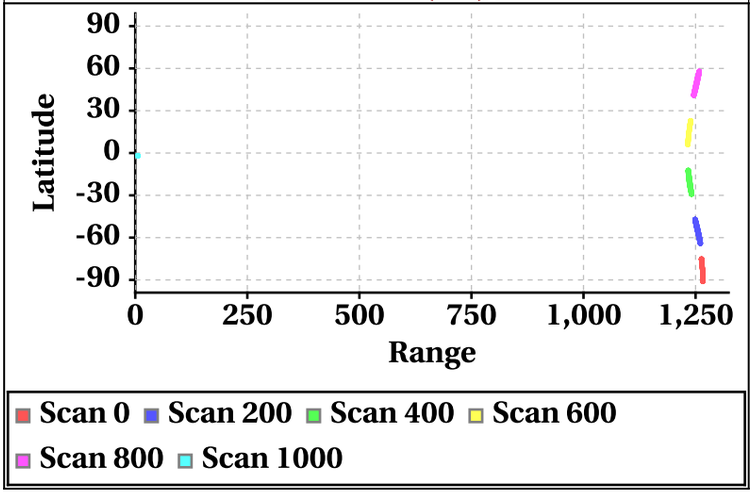


Latitude Vs Range

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

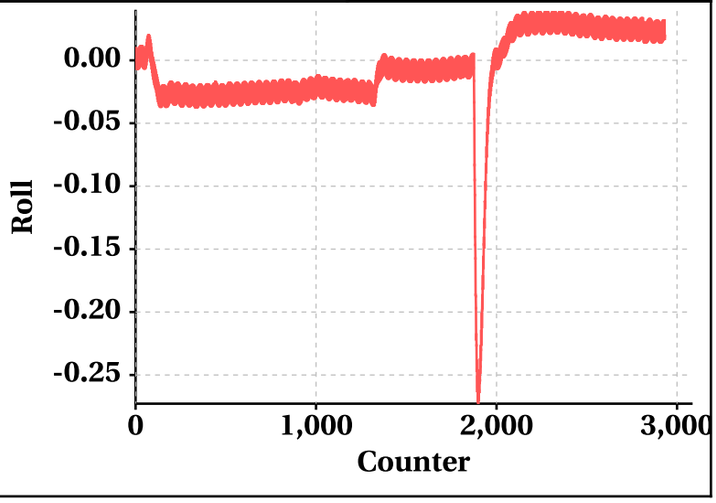


Range at Scan Interval of 200 [Outer Beam(VV)]

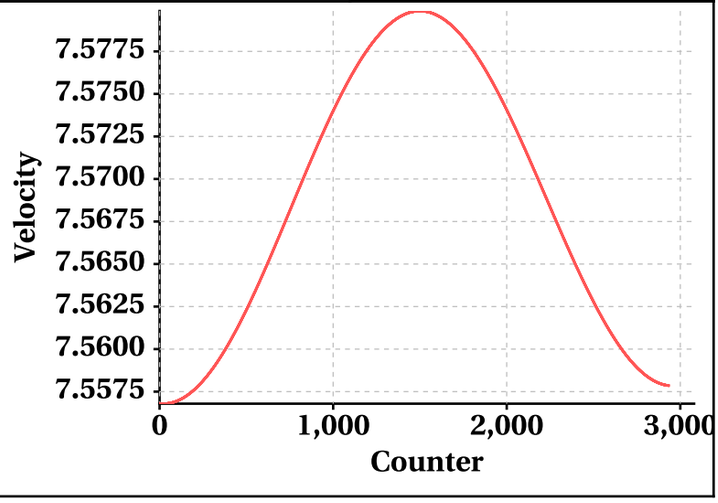


Variation in Orbit and Attitude Parameters

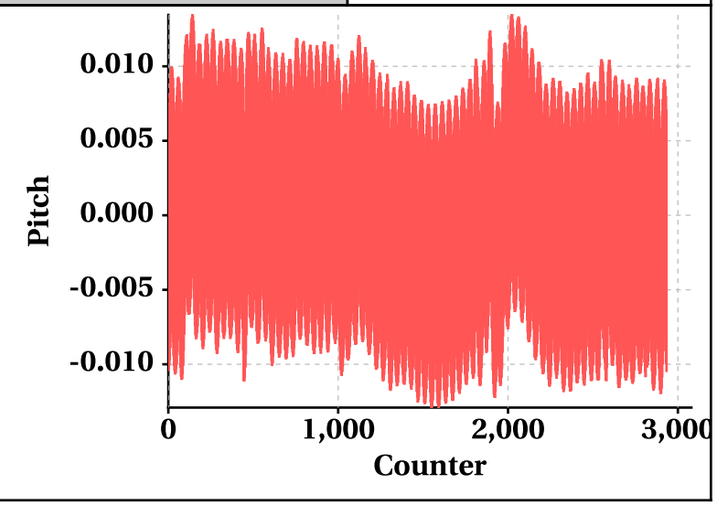
Roll	
Min Roll(deg)	-0.272801
Max Roll(deg)	0.039198



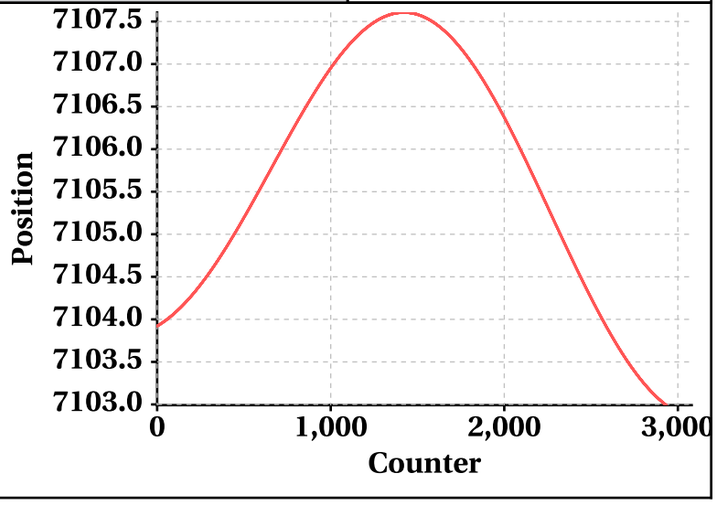
Velocity	
Min Velocity(km/s)	7.556791
Max Velocity(km/s)	7.579875



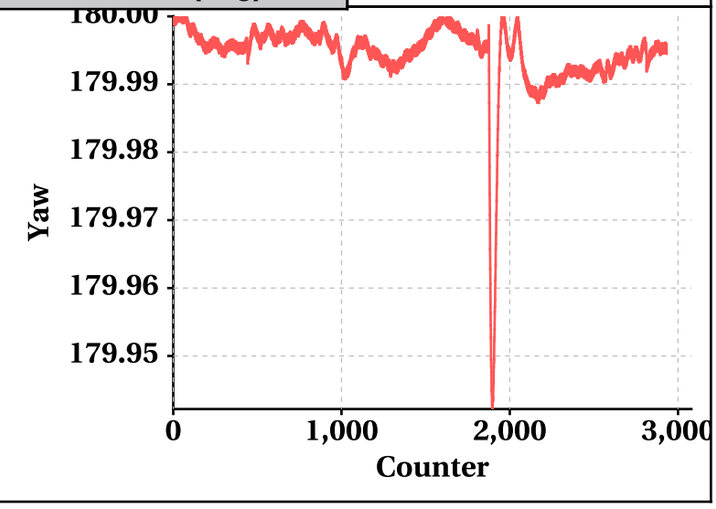
Pitch	
Min Pitch(deg)	-0.012908
Max Pitch(deg)	0.01345



Position	
Min Position(km)	7102.991699
Max Position(km)	7107.606445



Yaw	
Min Yaw(deg)	179.942184
Max Yaw(deg)	180.0



TimeDifference	
Min TimeDifference	1.0
Max TimeDifference	1.0

