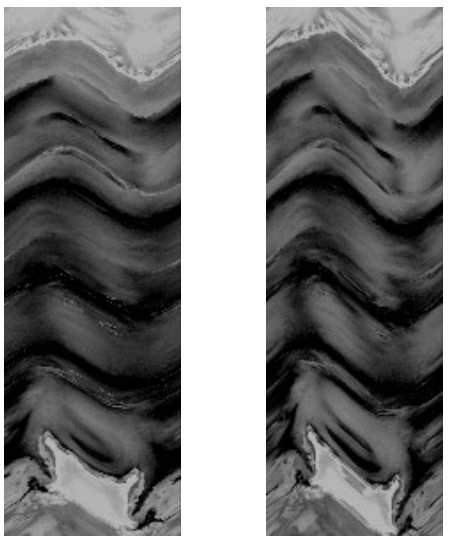
SCATSAT-1 Scatterometer Level-1B Data Quality Evaluation Report

Table of Contents

Image Snapshot for Inner & Outer Beam

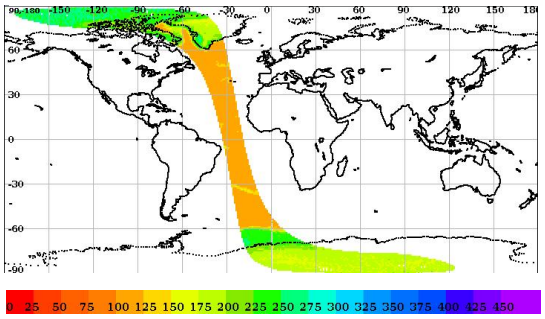
Inner (HH) **Outer (VV)**



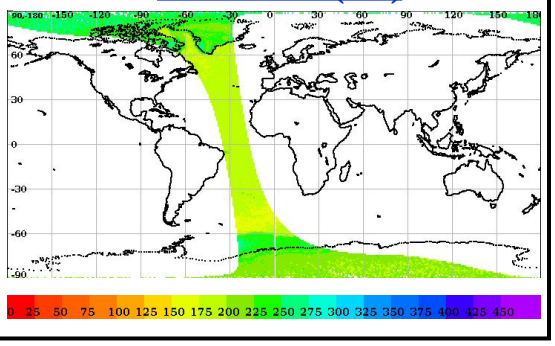
Satellite Id	ScatSat-1	**Start Orbit**	19802	**Total Scans**	1017
Sensor Name	Scatterometer	**End Orbit**	19803	**No of Inner FootPrints**	281
Processor Version	v1.1.4	**Rev. Number**	19802_19803	**No Of Outer FootPrints**	282
Half Orbit Direction	SN	**Data Production Date**	23-06-2020	**No. Of Inner Slices**	9
Equator Crossing Date	22-06-2020	**Equator Crossing Time**	21:56:24.000	**No Of Outer Slices**	15

Brightness Temprature(k) Footprint trace

Inner Beam (HH)

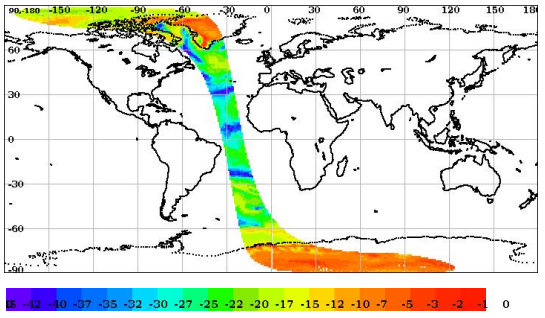


Outer Beam (VV)

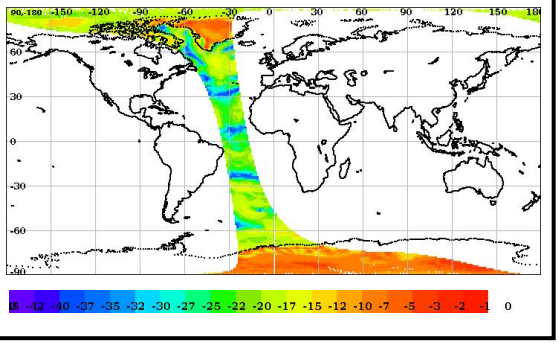


Sigma0(dB) Footprint trace

Inner Beam (HH)



Outer Beam (VV)



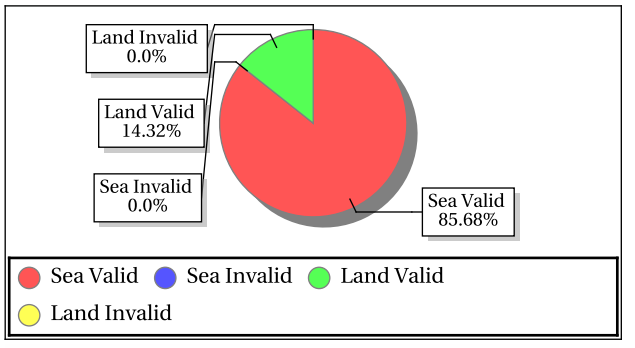
Invalid and Poor Sigma-0 Quality Flag Statistics for Inner/Outer Slices*

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(%)	22.23	13.35
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 (%)	0.053868	0.117054

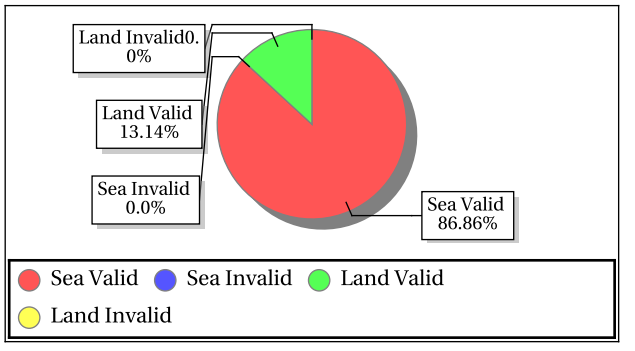
*DP Format Document

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	-6.63	-5.19	-5.68	0.51	164.92	191.60	176.70	8.87
GreenLand_2	77.50	-41.50	Inner	ASC	Fore	-6.73	-4.77	-5.86	0.66	165.10	192.95	177.49	8.83
GreenLand_3	71.55	-42.45	Inner	ASC	Aft	-10.94	-8.74	-9.84	0.60	181.44	223.20	200.39	13.43
GreenLand_3	71.55	-42.45	Inner	ASC	Fore	-12.51	-8.74	-10.26	1.12	163.22	217.85	197.62	12.75
GreenLand_1	74.69	-42.50	Inner	ASC	Aft	-11.78	-9.05	-9.95	0.71	160.39	212.32	186.59	13.60
GreenLand_1	74.69	-42.50	Inner	ASC	Fore	-10.61	-8.61	-9.64	0.59	167.94	214.63	189.55	12.82
GreenLand_2	77.50	-41.50	Outer	ASC	Aft	-6.04	-5.05	-5.51	0.35	218.97	250.39	235.28	11.38
GreenLand_2	77.50	-41.50	Outer	ASC	Fore	-5.91	-4.91	-5.49	0.38	198.17	224.31	215.52	10.19
GreenLand_3	71.55	-42.45	Outer	ASC	Aft	-12.45	-10.77	-11.73	0.53	199.51	269.37	233.91	20.07
GreenLand_3	71.55	-42.45	Outer	ASC	Fore	-12.61	-10.45	-11.59	0.59	223.37	250.60	236.28	7.85
GreenLand_1	74.69	-42.50	Outer	ASC	Aft	-11.02	-8.56	-9.91	0.83	214.53	246.09	227.95	9.83
GreenLand_1	74.69	-42.50	Outer	ASC	Fore	-9.64	-8.65	-9.20	0.37	205.54	246.44	222.81	12.49

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	269.41	0.44	4.680	0.12	244.52	0.39	3.704	0.12	0.15	0.12	0.000	0.12	0.14	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	-34.44	18.43	4.03	0.000	-34.02	20.67	5.12	0.000	3.59	28.00	20.32	33.838	4.82	29.50	20.81	42.893

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	203.62	0.38	4.185	0.09	228.46	0.33	3.478	0.09	0.17	0.09	0.000	0.09	0.16	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	0.01	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	-34.39	12.65	1.98	0.000	-34.89	13.82	2.49	0.000	-1.20	22.78	15.15	0.108	-0.47	22.34	15.06	0.034

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)

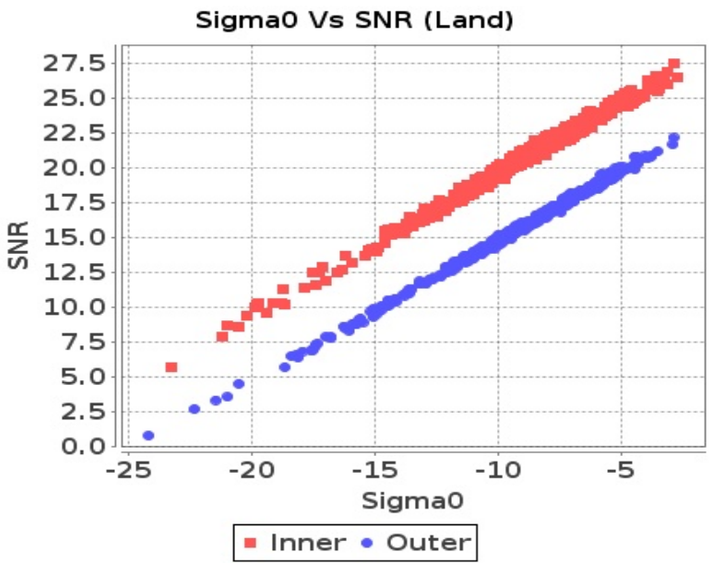
	Inner Beam (HH)				Outer Beam (VV)			
	Min	Max	Mean	Bad Occ. (%)	Min	Max	Mean	Bad Occ. (%)
Incidence Angle (deg)	48.76	49.38	49.05	0.000	57.58	58.24	57.94	0.000
Azimuth Diff. (deg)	0.0027	6.42	1.27	2.545	0.0000	297.16	1.27	3.794
Range(Km)	1036.84	1074.70	1052.72	0.000	1214.98	1262.54	1235.99	0.000
X Factor(dbm)	-91.39	-89.71	-90.23	0.000	-93.05	-91.75	-92.08	0.000
Across Distance (Km)	15.59	16.08	15.80	0.000	10.78	37.79	20.84	6.000
Along Distance (Km)	0.00	21.12	19.71	1.000	8.29	33.29	19.63	2.000

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

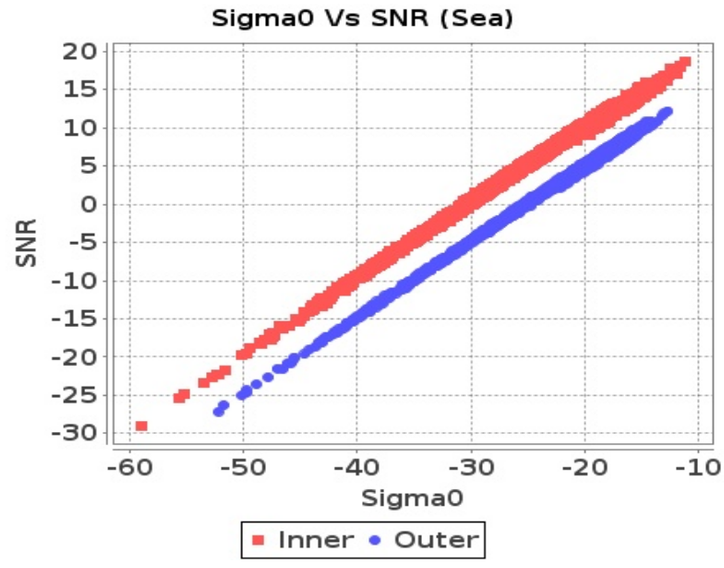
Normal
Deviations
Alarming
High Errors

Sigma0 Behaviour (Sigma0 Vs SNR)

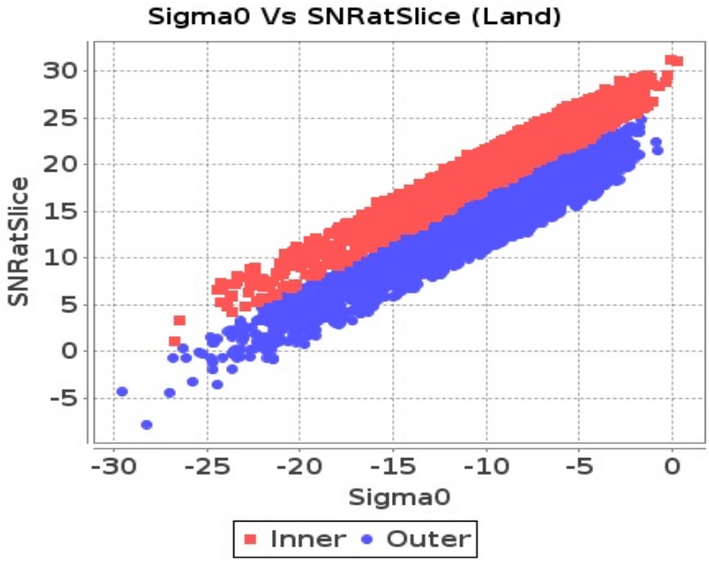
Footprint-Land



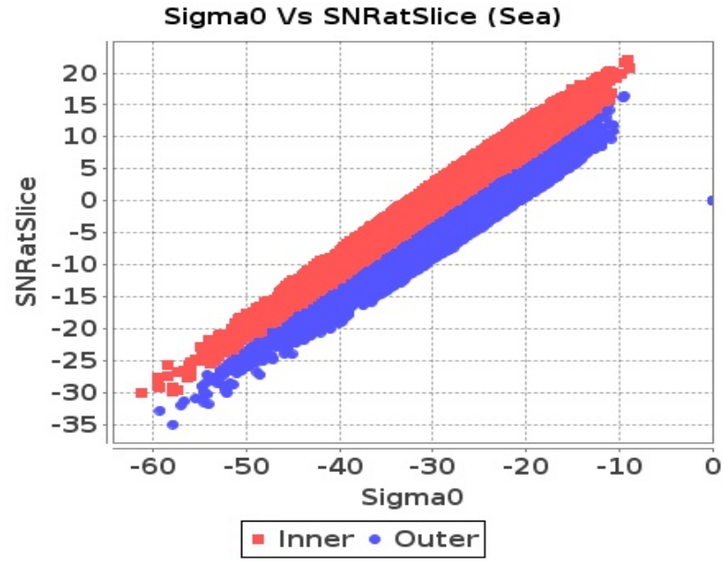
Footprint-Sea



Slice-Land

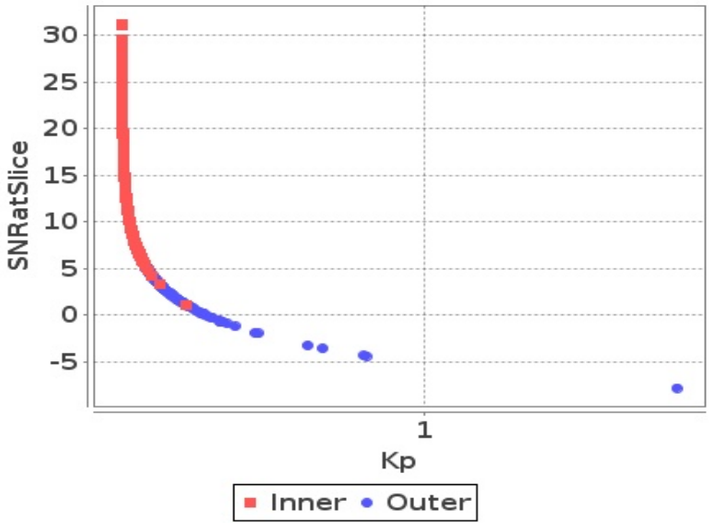


Slice-Sea

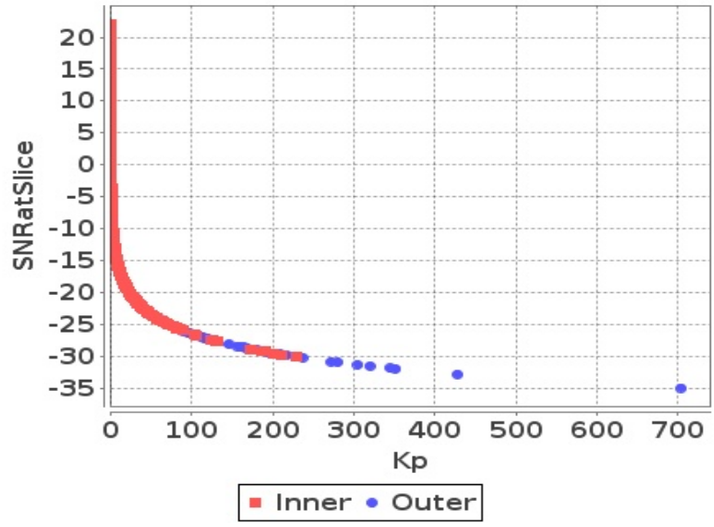


Sigma0 Behaviour (Kp Vs SNR)

Slice

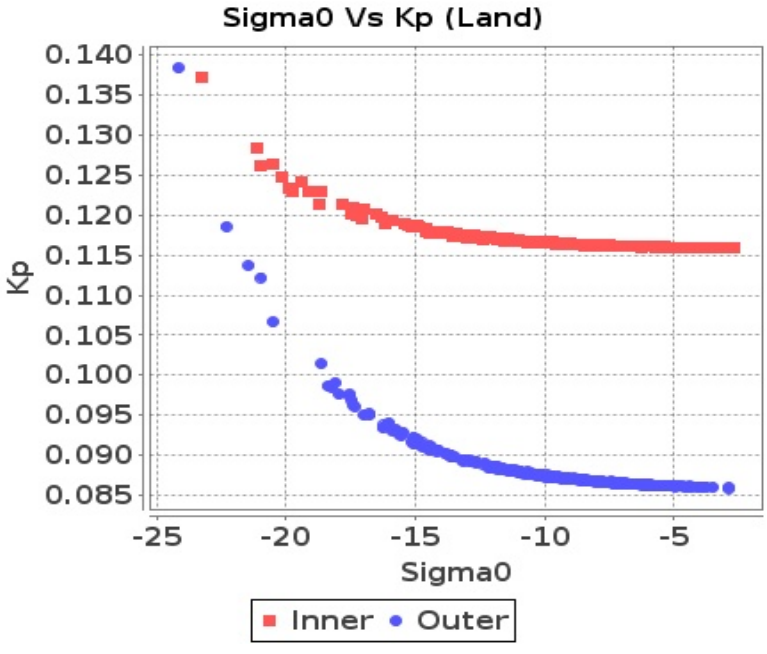


Slice

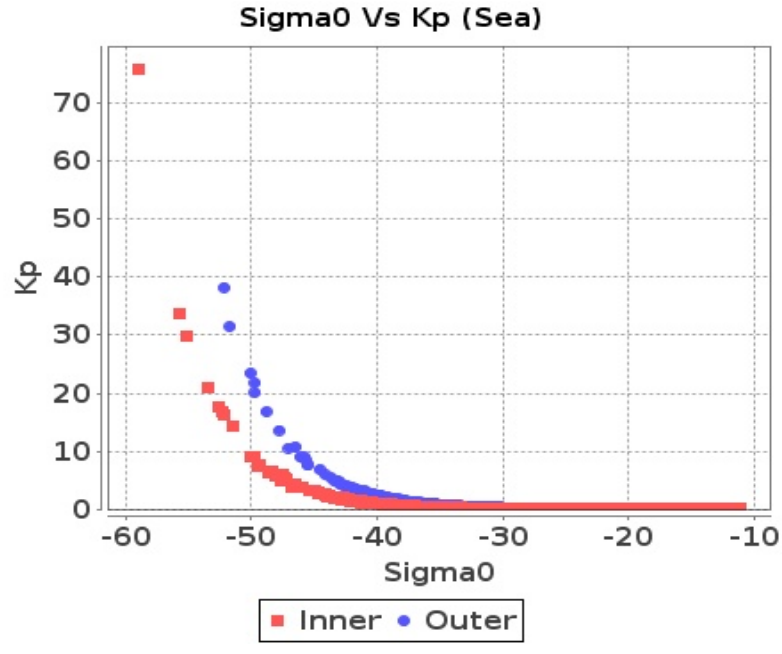


Sigma0 Behaviour(Sigma0 Vs Kp)

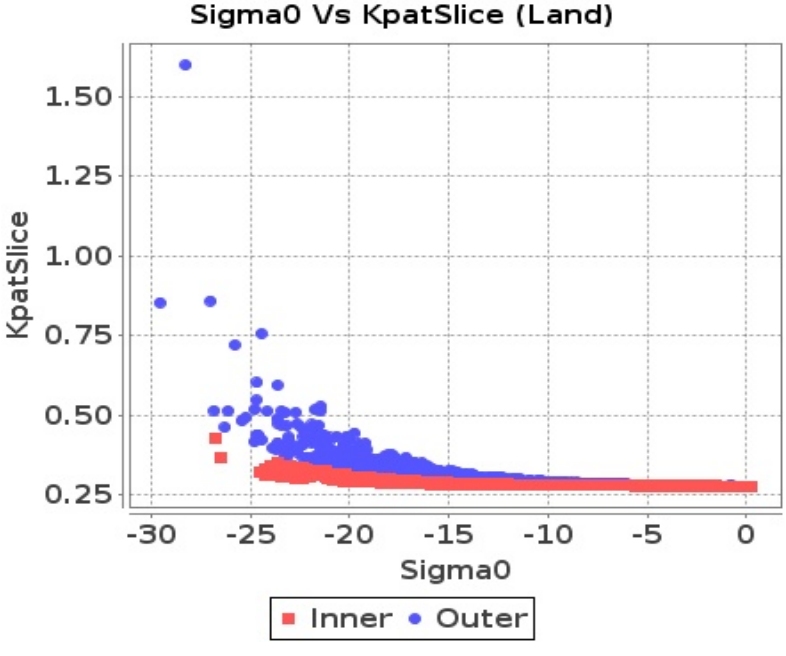
Footprint-Land



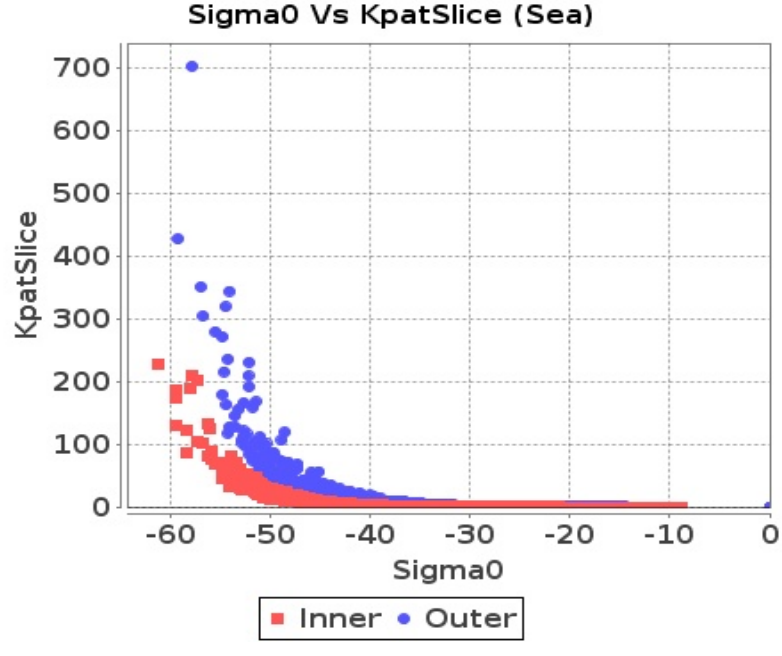
Footprint-Sea



Slice-Land



Slice-Sea

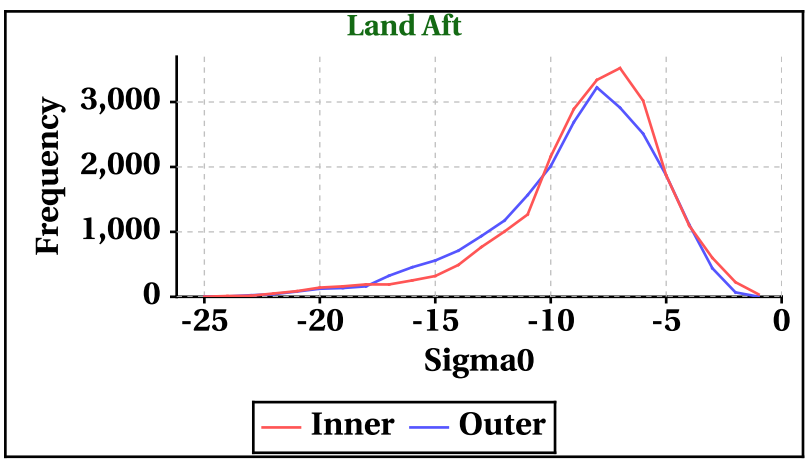


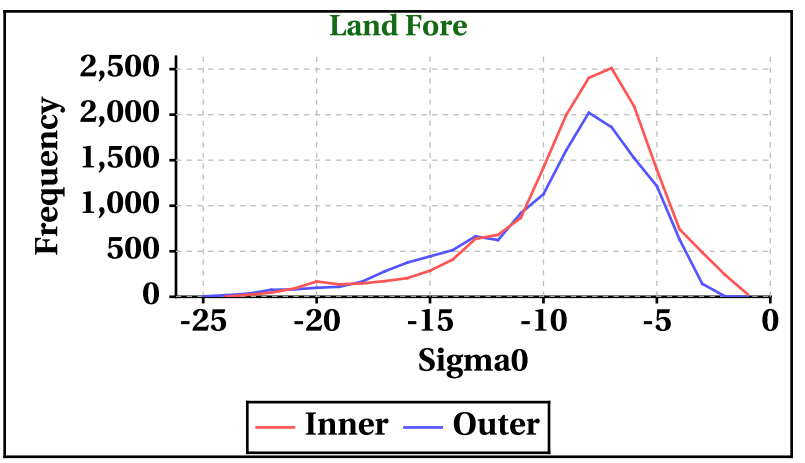
Dynamic Range (Data Histograms)

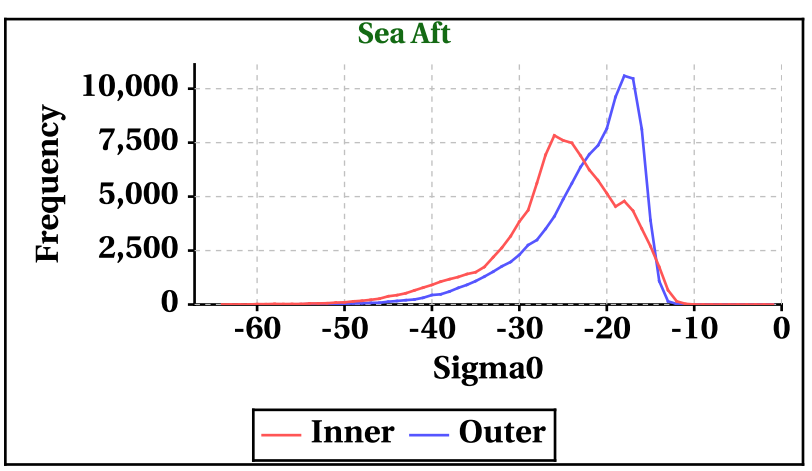
Sigma0(db)

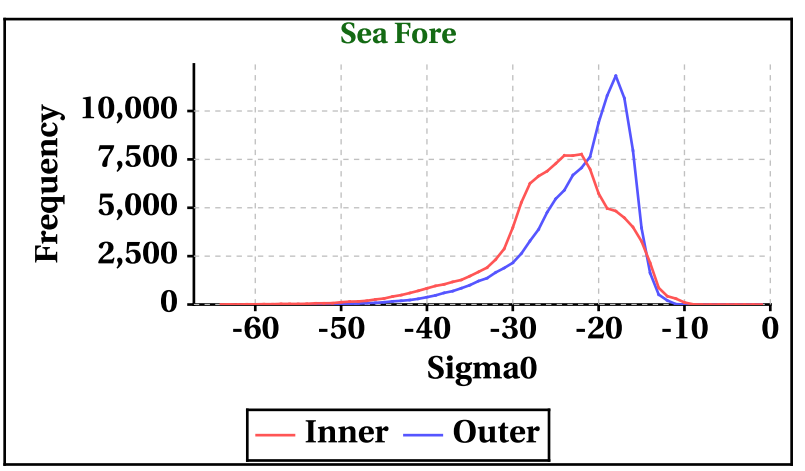
Inner Beam (HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-25	-24	-64	-64
Max	0	0	0	0

Outer Beam (VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-25	-25	-59	-60
Max	0	0	0	0





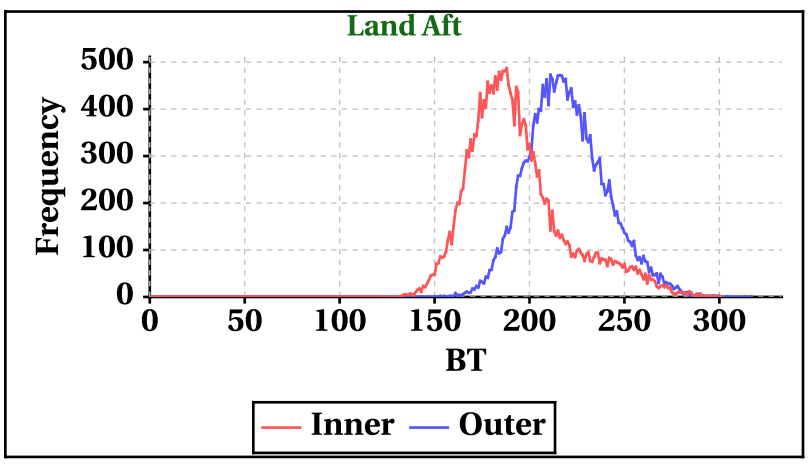


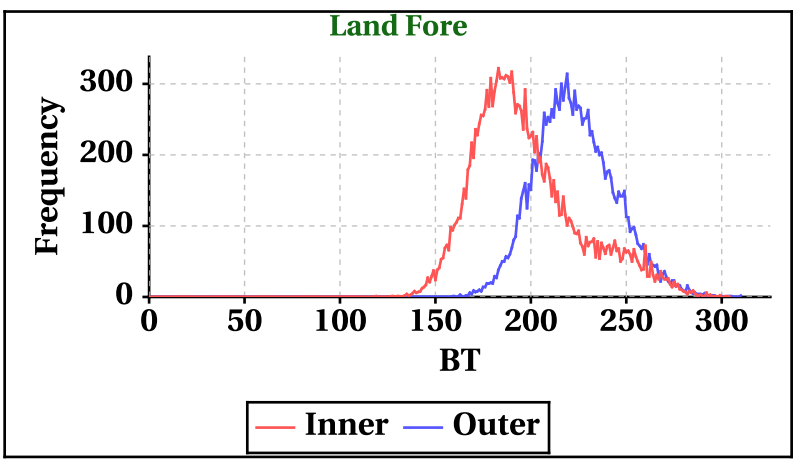


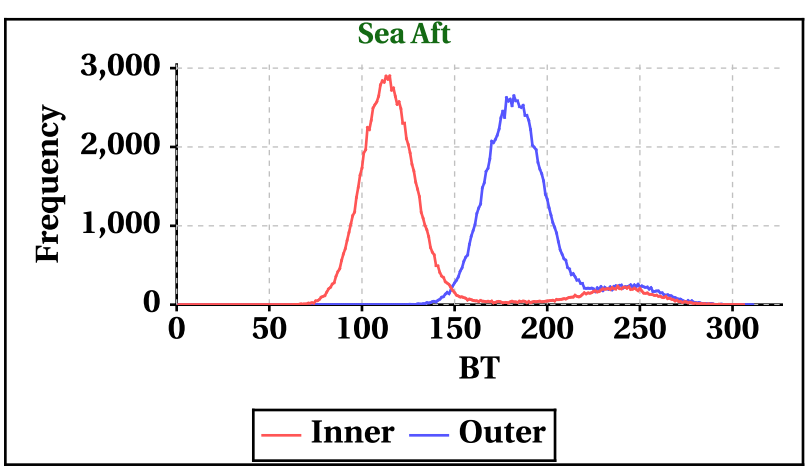
Brightness Temperature(K)

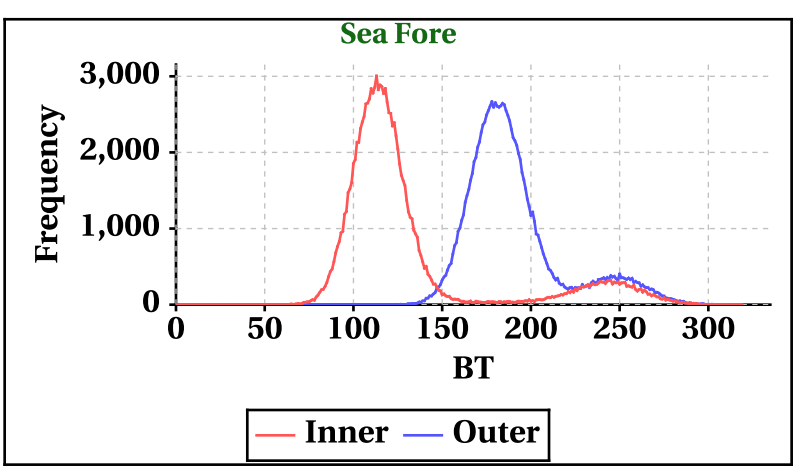
Inner Beam(HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	0	0
Max	301	304	306	319

Outer Beam(VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	0	0
Max	317	310	311	313







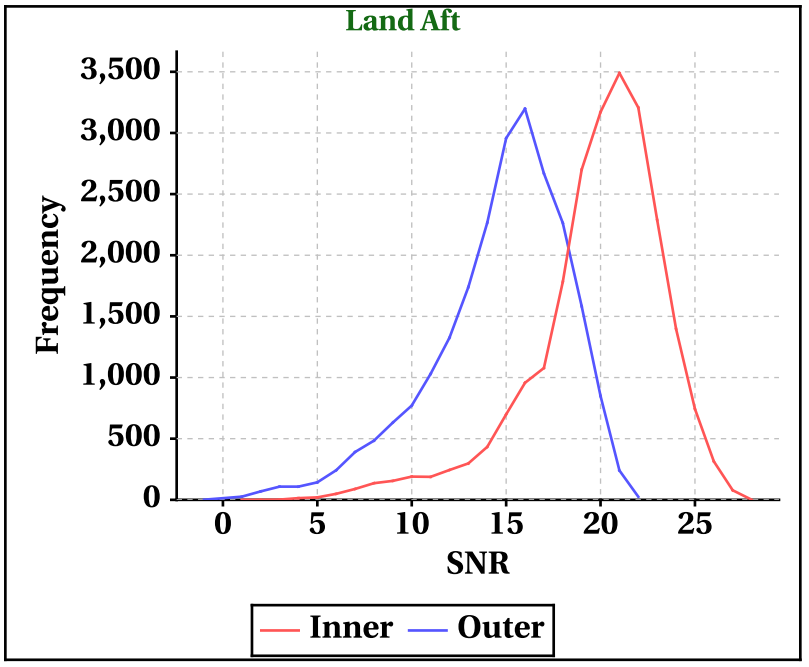


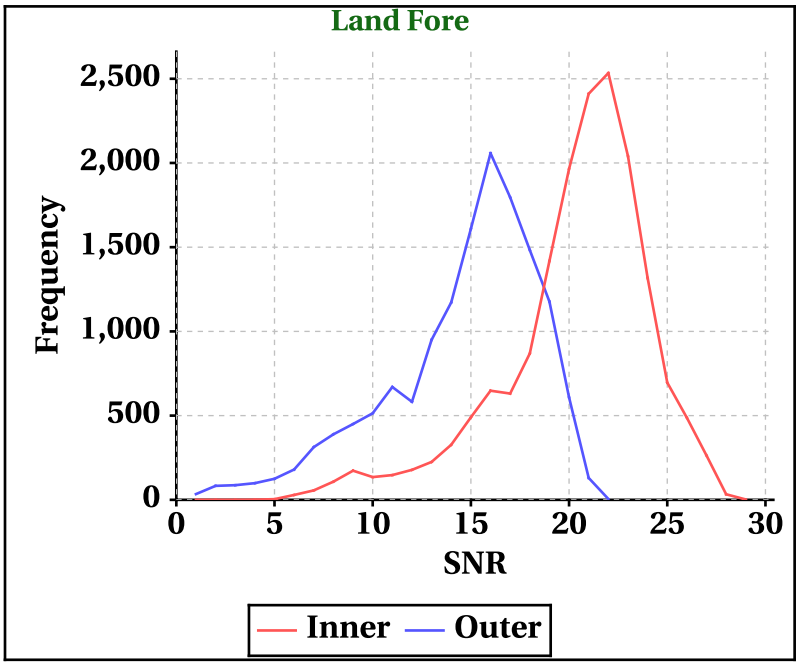
Dynamic Range (Data Histograms)

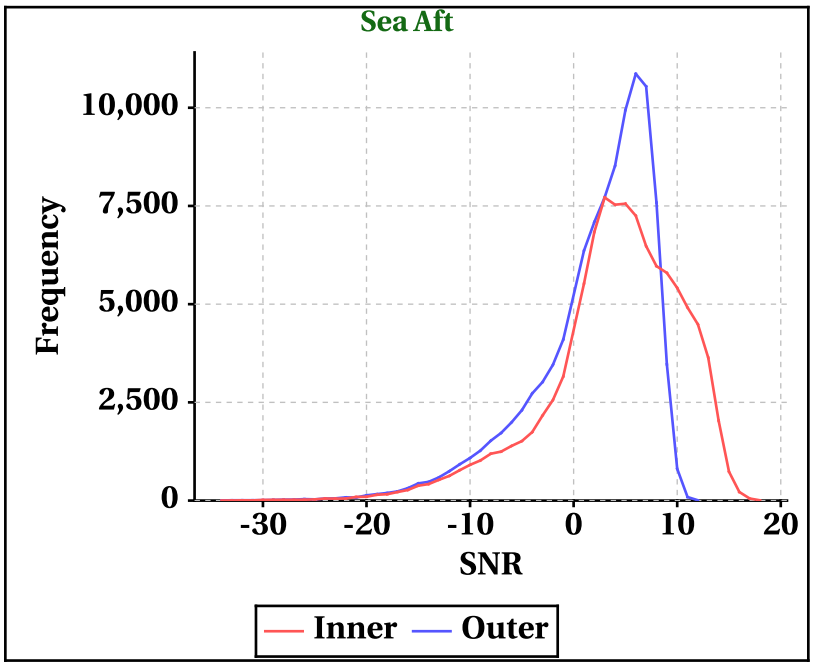
SNR(dBm)

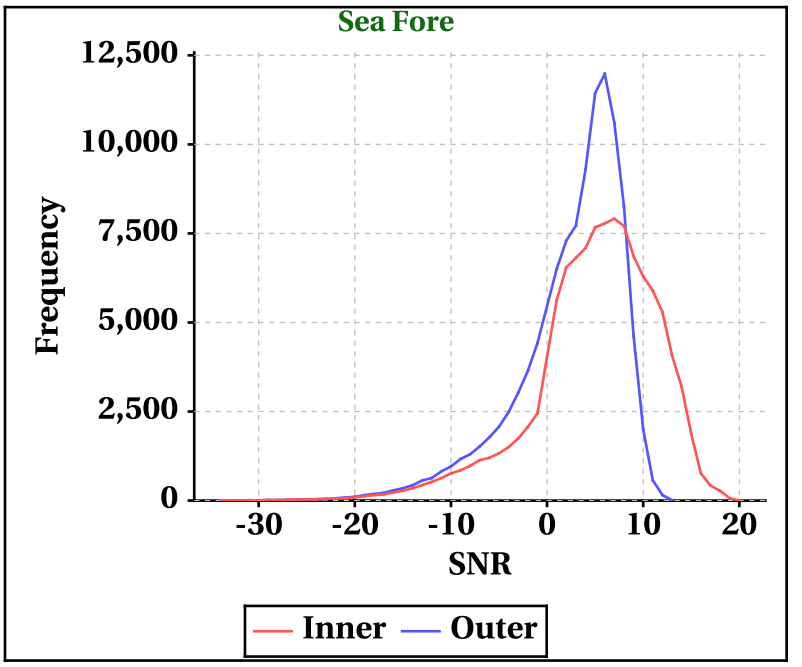
Inner Beam (HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	-34	-34
Max	28	29	18	20

Outer Beam (VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-1	0	-34	-34
Max	22	22	12	13



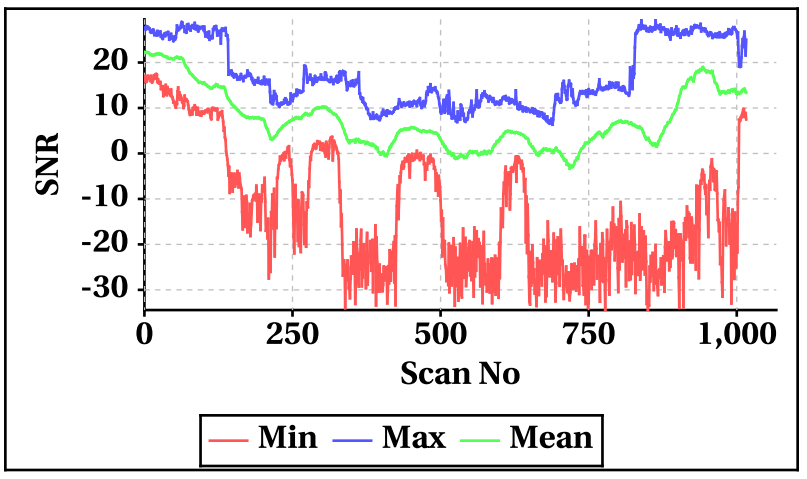




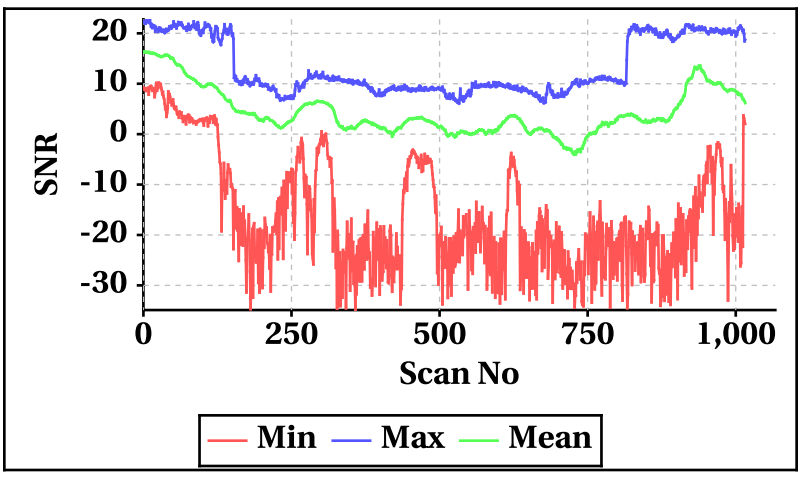


Orbit-wise behaviour of SNR

Inner Beam (HH)

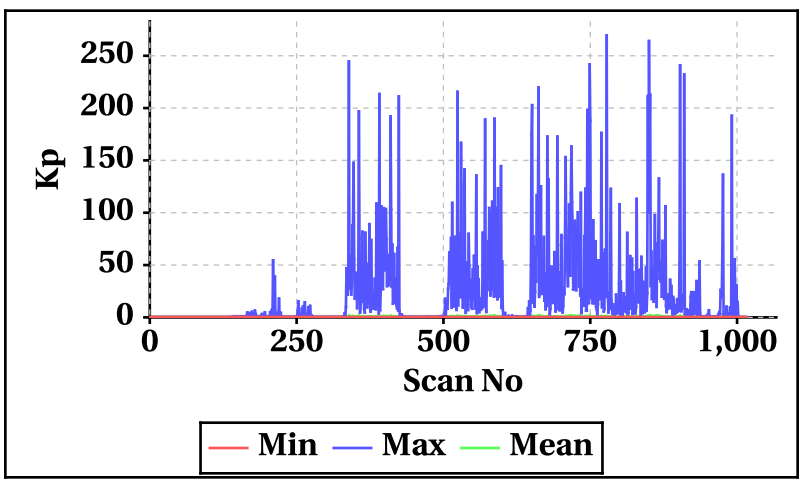


Outer Beam(VV)

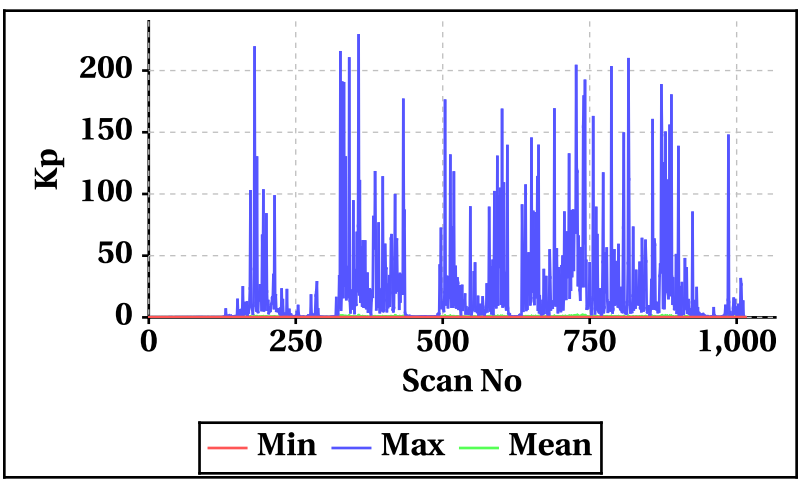


Orbit-wise behaviour of Kp,Kpa,Kpb,Kpc

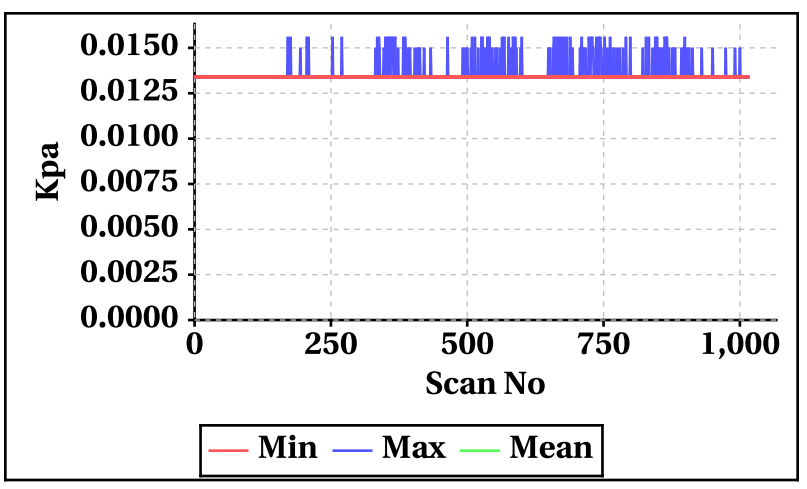
Inner Beam(HH)



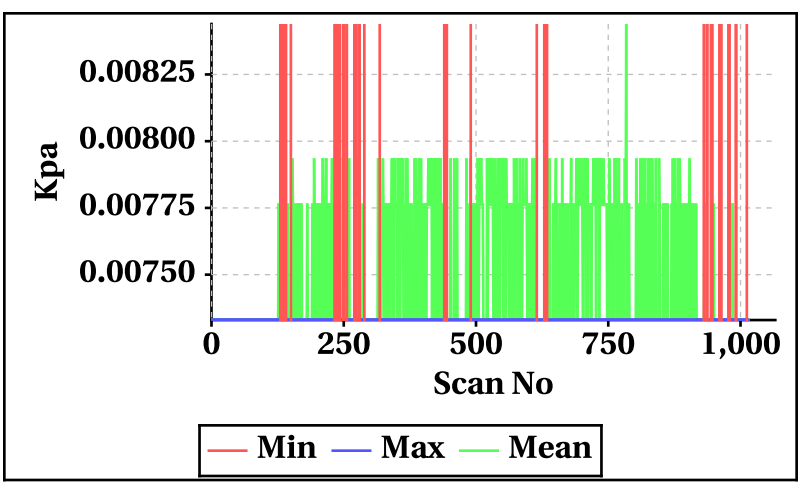
Outer Beam(VV)



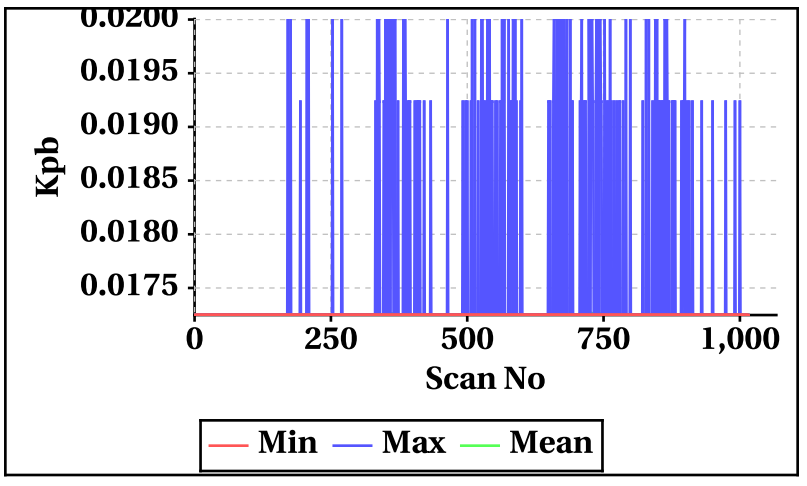
Inner Beam(HH)



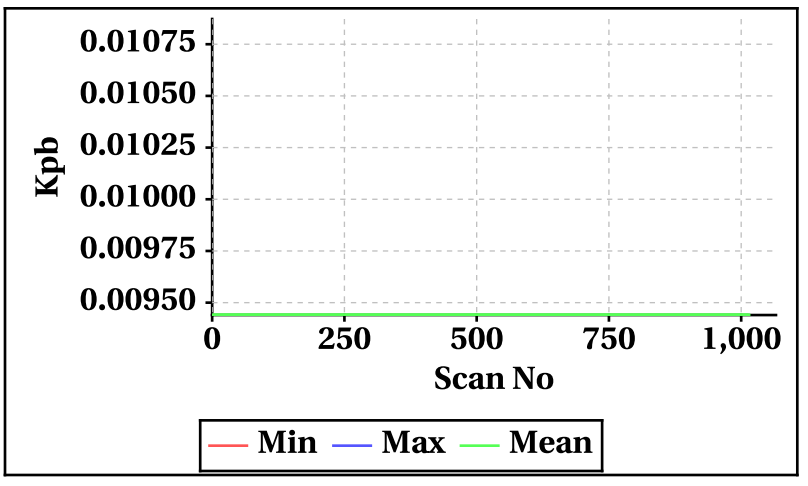
Outer Beam(VV)



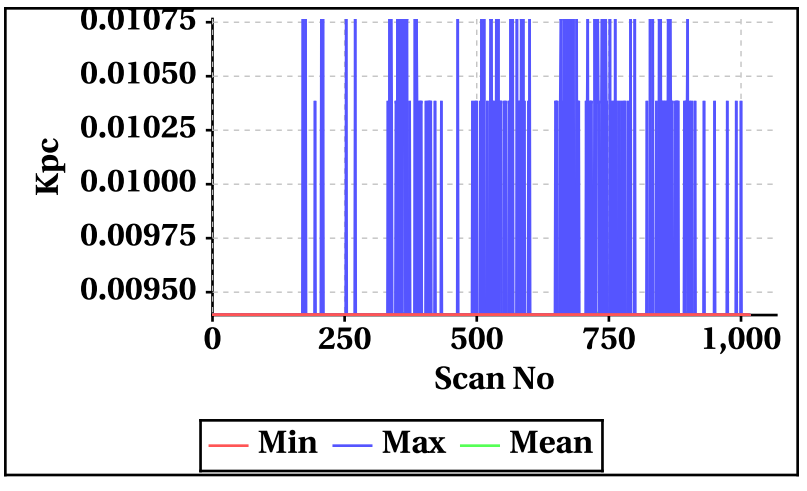
Inner Beam(HH)



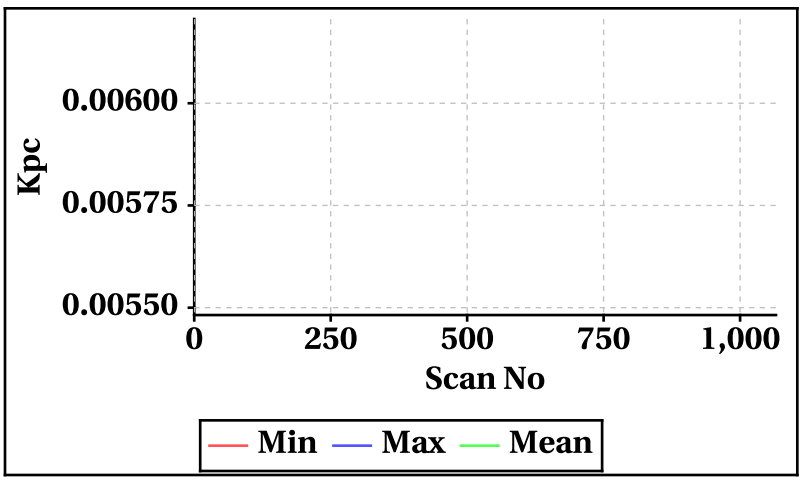
Outer Beam(VV)



Inner Beam(HH)

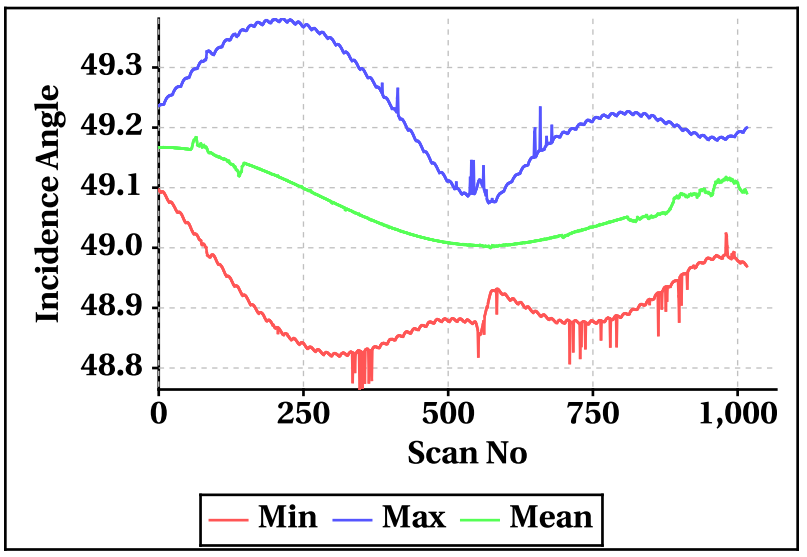


Outer Beam(VV)

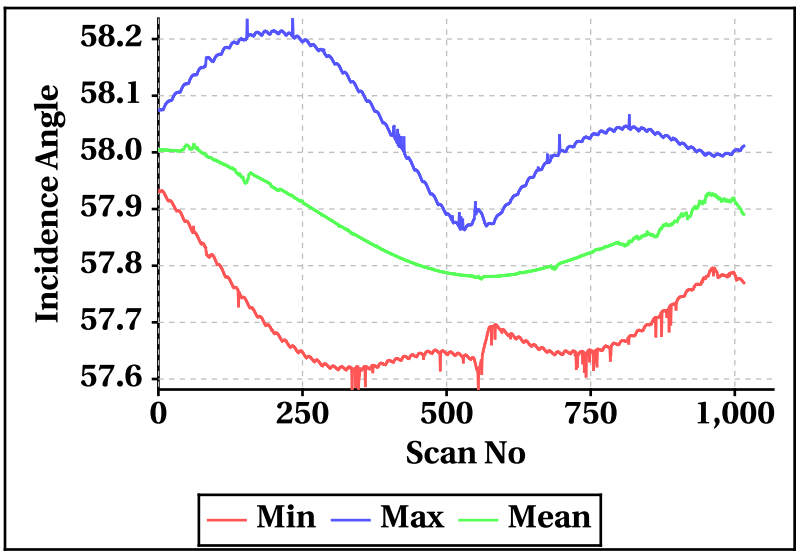


Orbit-wise behaviour of Incidence,Azimuth,Range,X-Factor

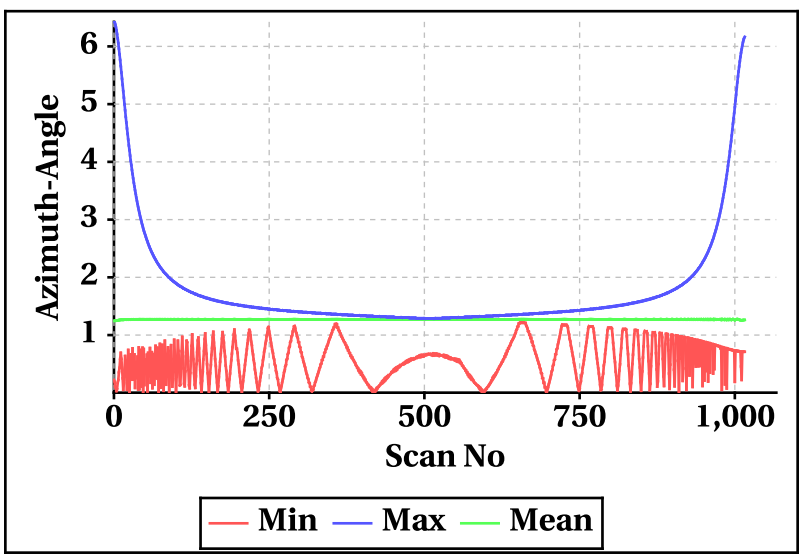
Inner Beam (HH)



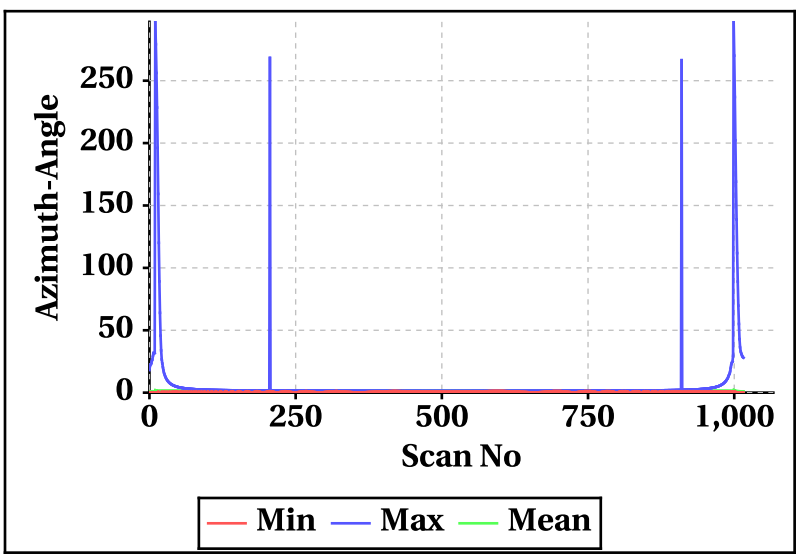
Outer Beam(VV)



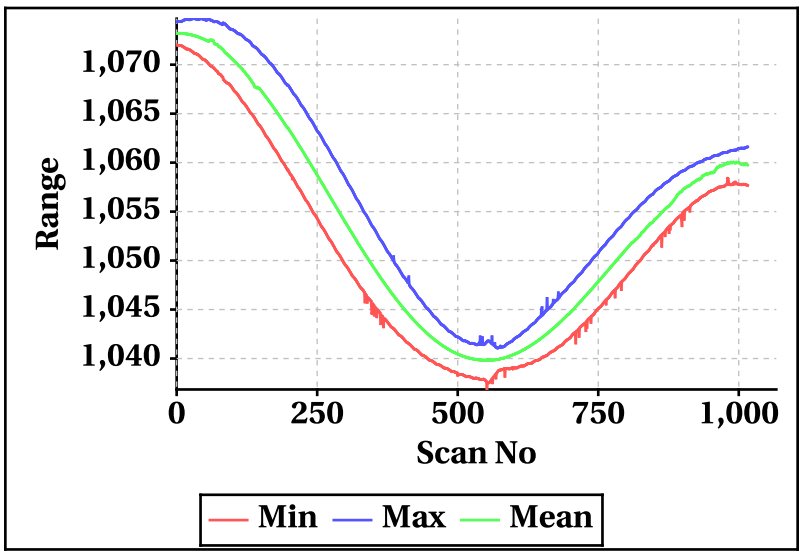
Inner Beam (HH)



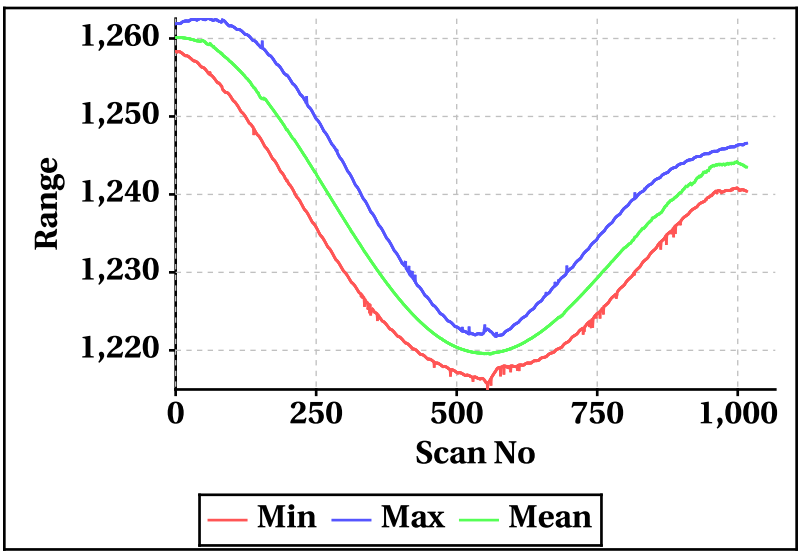
Outer Beam(VV)



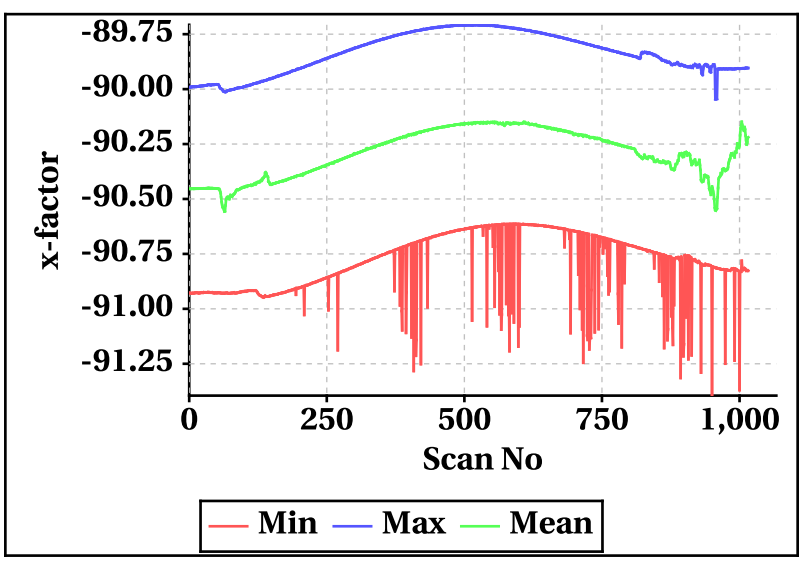
Inner Beam (HH)



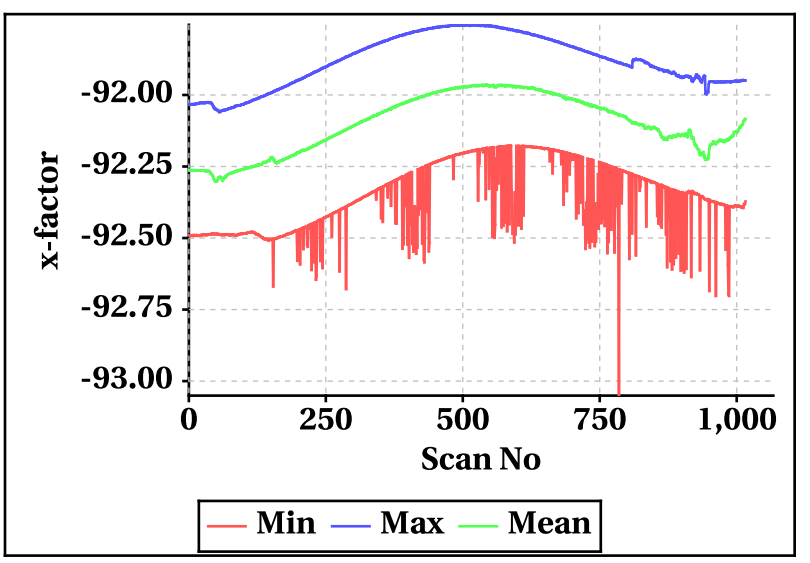
Outer Beam(VV)



Inner Beam (HH)



Outer Beam(VV)



Doppler Frequency Variation

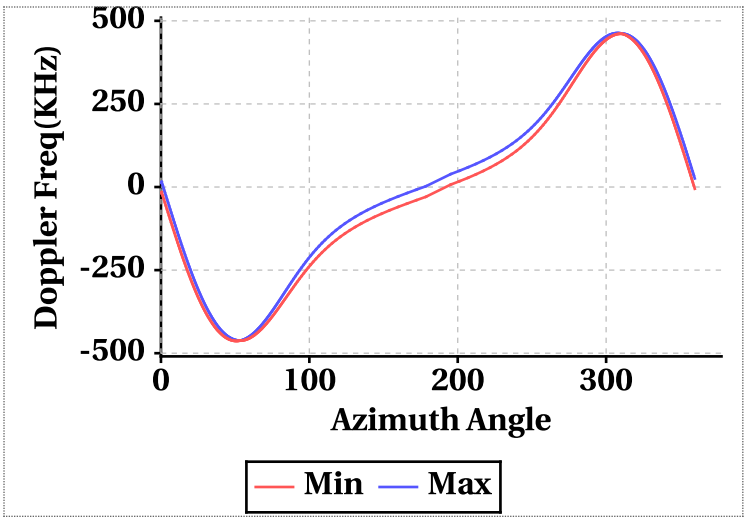
Doppler Frequency(KHz) variation statistics Over the half Orbit

	Inner Beam (HH)	Outer Beam (VV)
Min	-463.26	-519.14
Max	463.26	519.14

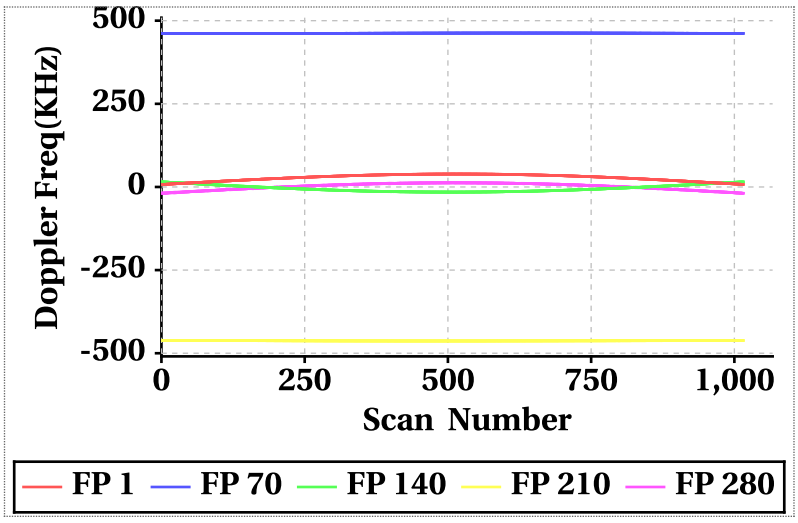
Doppler Frequency(KHz) variation

	Inner Beam (HH)			Outer Beam (VV)		
Doppler_FP	Min	Max	Mean	Min	Max	Mean
Doppler_1	7.30	38.84	27.44	2.62	37.90	25.14
Doppler_70	461.04	462.80	462.10	516.64	518.86	518.02
Doppler_140	-15.58	15.48	-4.26	-23.32	11.58	-10.60
Doppler_210	-463.18	-461.26	-462.51	-518.92	-517.12	-518.31
Doppler_280	-19.12	12.64	1.02	-15.50	20.06	7.04

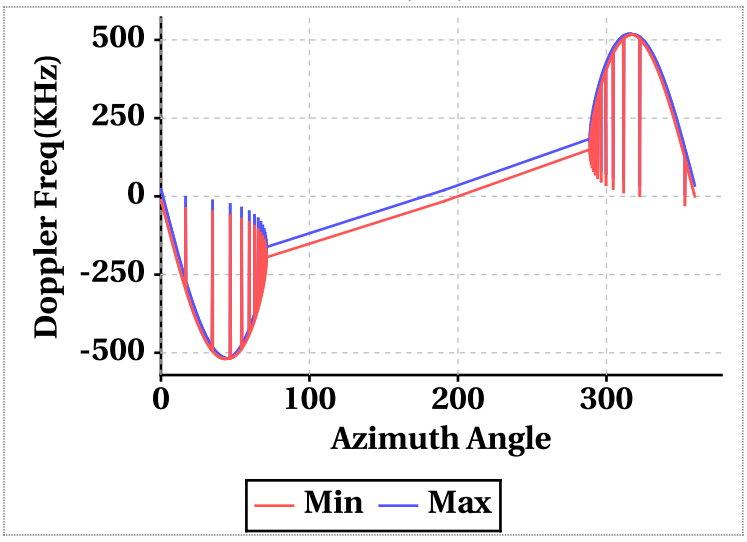
Footprint wise Doopler frequency variation Inner Beam (HH)



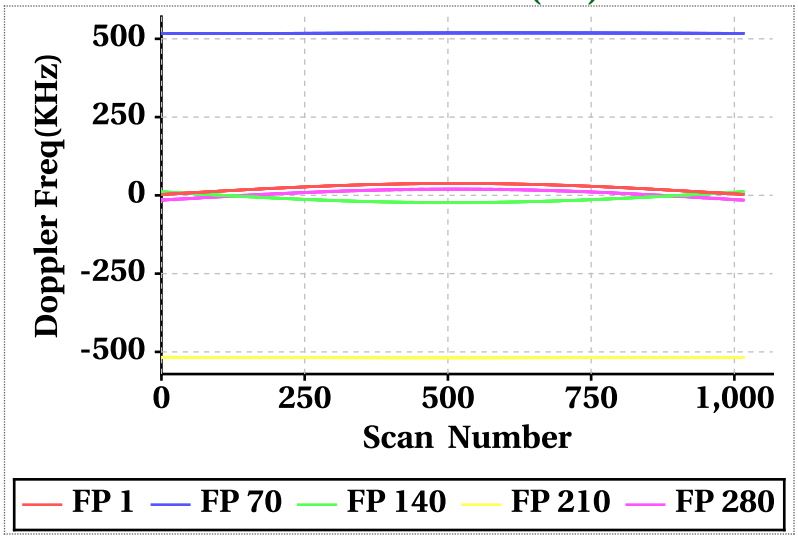
Doppler frequency variation at footprints: 1, 70, 140, 210 & 280 Inner Beam (HH)



Footprint wise Doopler frequency variation Outer Beam (VV)

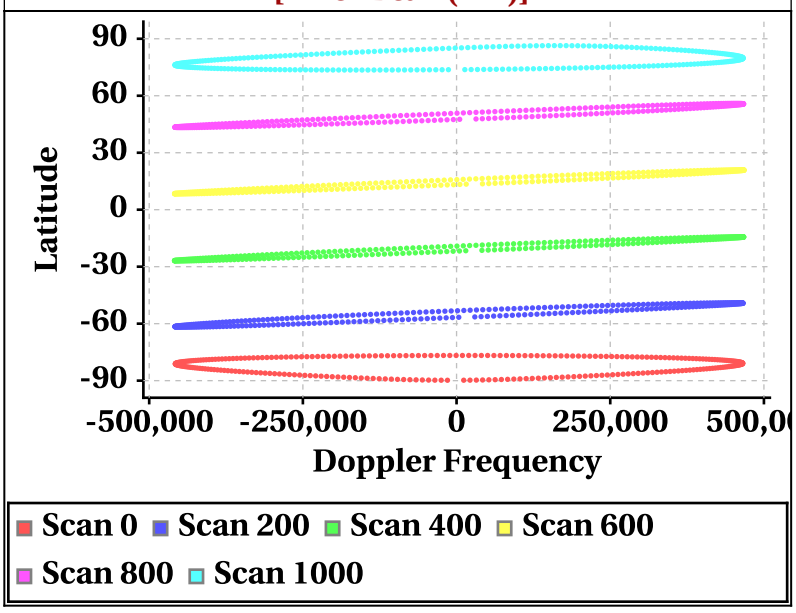


Doppler frequency variation at footprints: 1, 70, 140, 210 & 280 Outer Beam (VV)

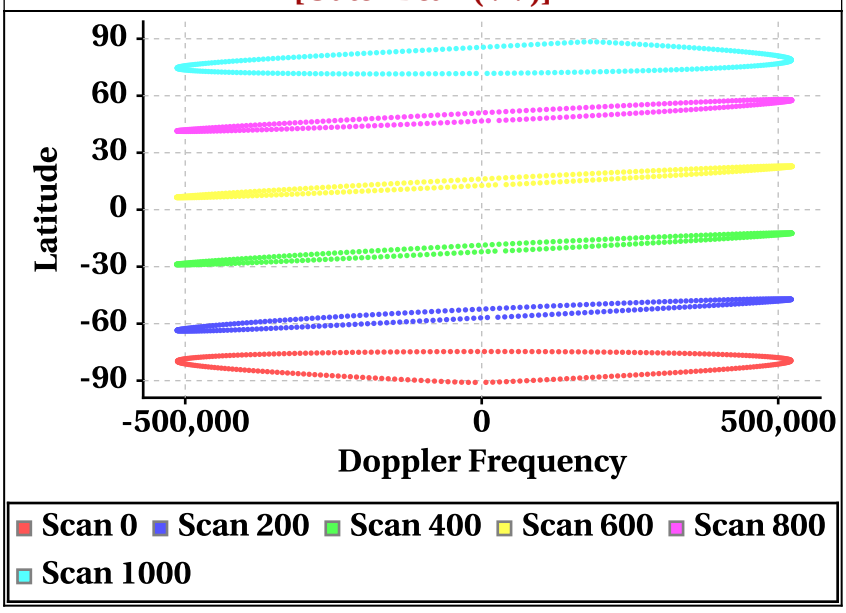


Latitude Vs Doppler Frequency

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



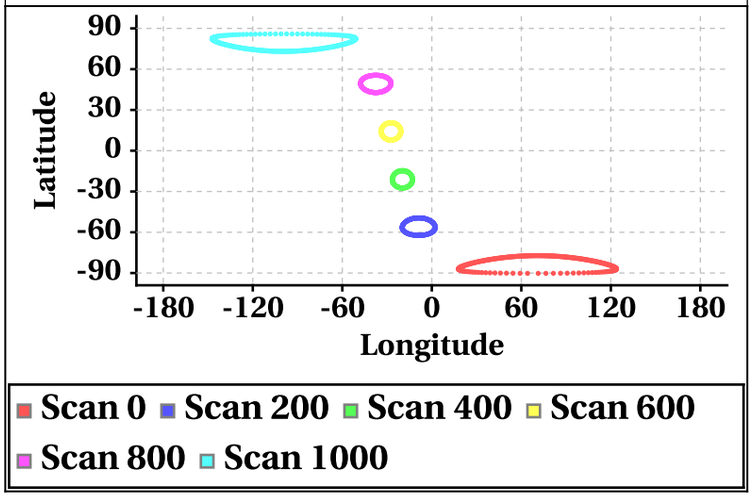
Doppler Frequency at Scan Interval of 200 [Outer Beam(VV)]



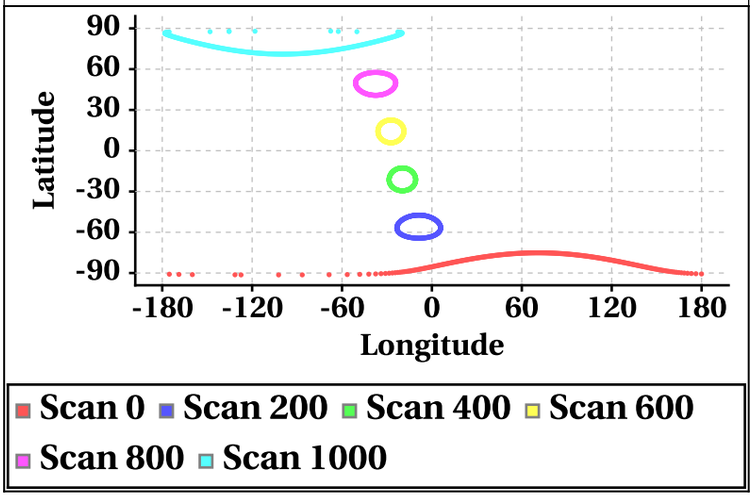
Parameter as a function of Latitude

Latitude Vs Longitude

Scan Trace [Inner Beam(HH)]

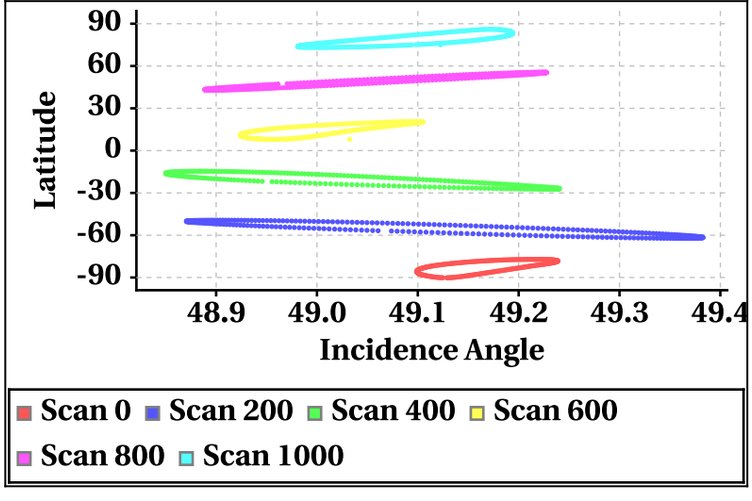


Scan Trace [Outer Beam (VV)]

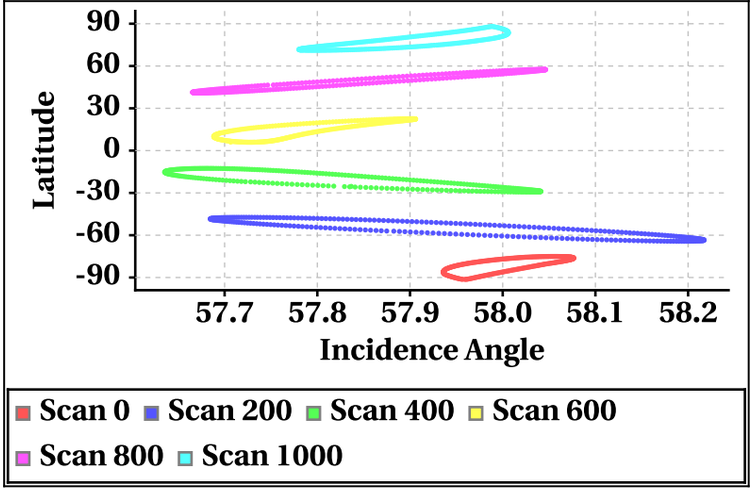


Latitude Vs Incidence Angle

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

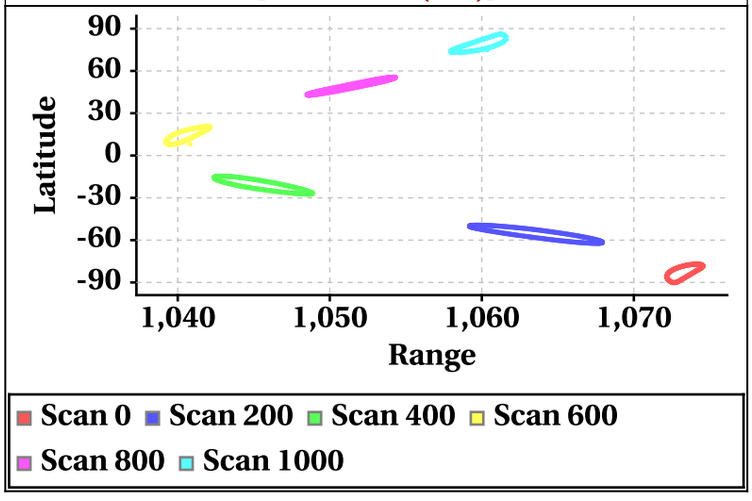


Incidence Angle at Scan Interval of 200 [Outer Beam (VV)]

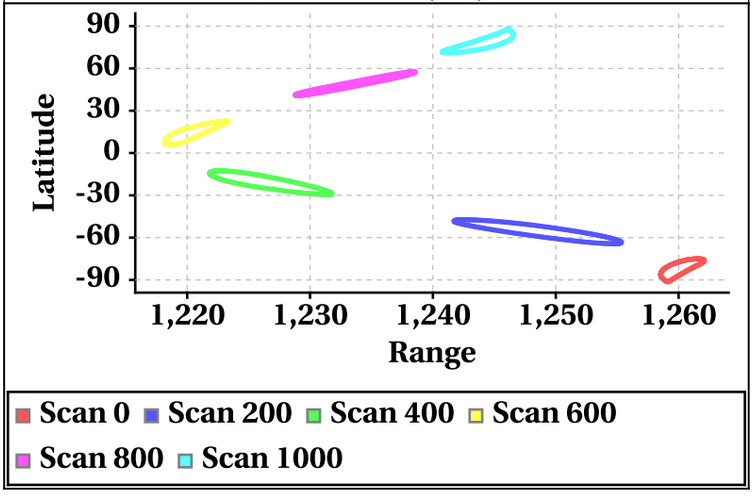


Latitude Vs Range

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



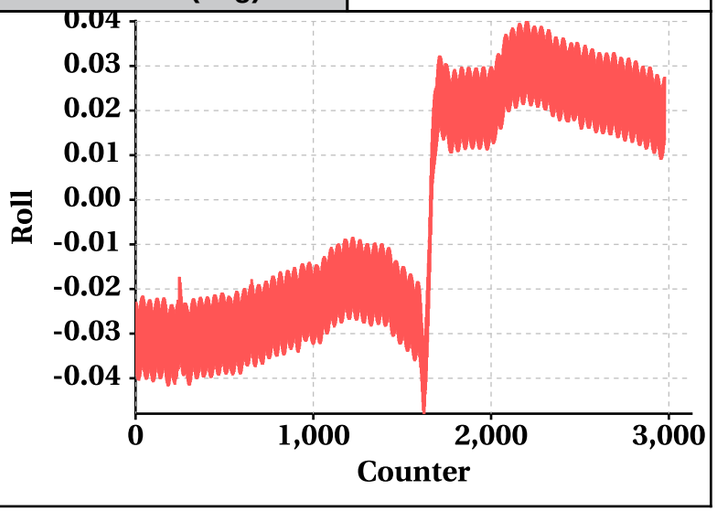
Range at Scan Interval of 200 [Outer Beam(VV)]



Variation in Orbit and Attitude Parameters

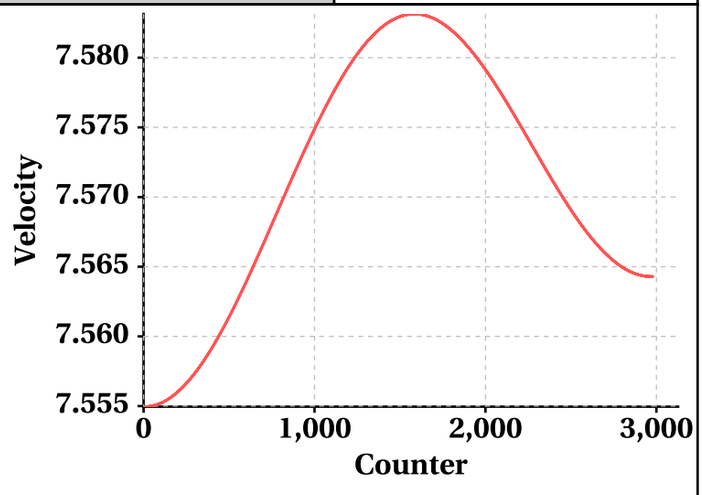
Roll

Min Roll(deg)	-0.047948
Max Roll(deg)	0.040082



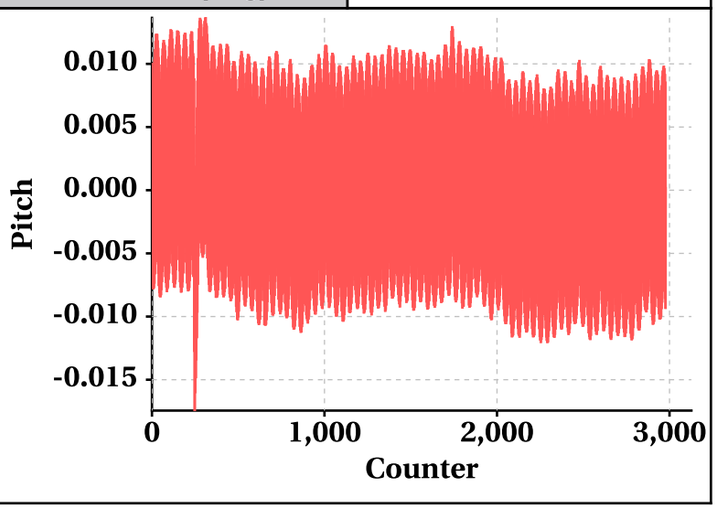
Velocity

Min Velocity(km/s)	7.554955
Max Velocity(km/s)	7.583137



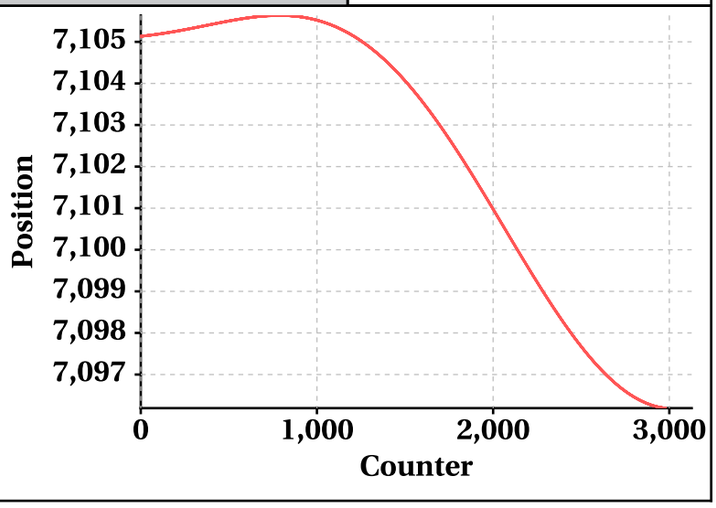
Pitch

Min Pitch(deg)	-0.017445
Max Pitch(deg)	0.013638



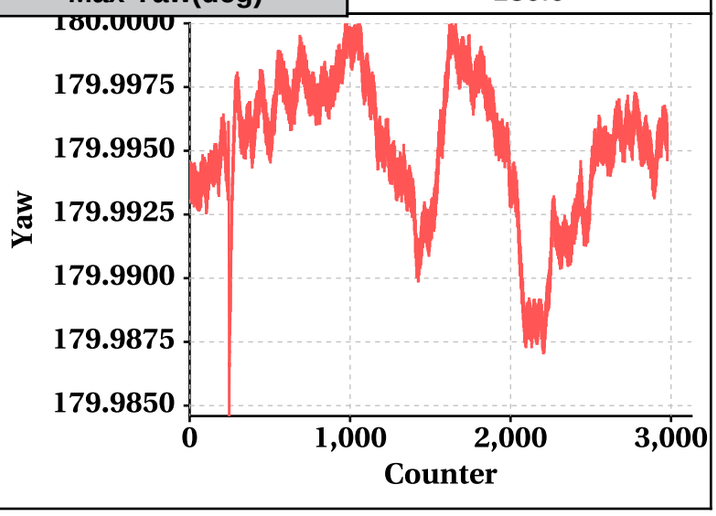
Position

Min Position(km)	7096.191406
Max Position(km)	7105.634277



Yaw

Min Yaw(deg)	179.984589
Max Yaw(deg)	180.0



TimeDifference

Min TimeDifference	1.0
Max TimeDifference	1.0