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

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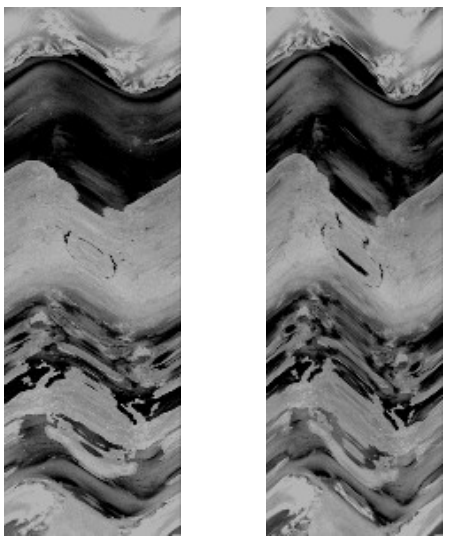
Image Snapshot for Inner & Outer Beam

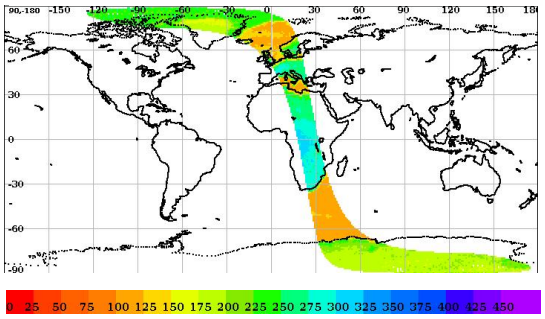
Inner (HH) **Outer (VV)**



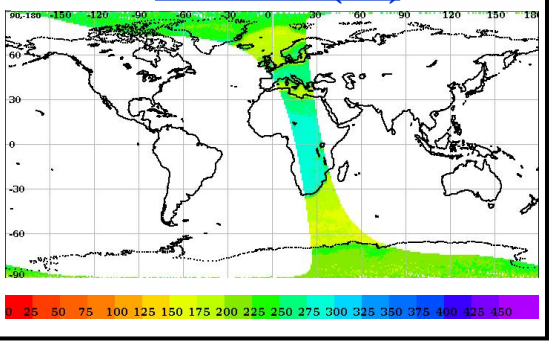
Satellite Id	ScatSat-1	**Start Orbit**	17480	**Total Scans**	1017
Sensor Name	Scatterometer	**End Orbit**	17481	**No of Inner FootPrints**	281
Processor Version	v1.1.4	**Rev. Number**	17480_17481	**No Of Outer FootPrints**	282
Half Orbit Direction	SN	**Data Production Date**	15-01-2020	**No. Of Inner Slices**	9
Equator Crossing Date	14-01-2020	**Equator Crossing Time**	18:46:25.000	**No Of Outer Slices**	15

Brightness Temprature(k) Footprint trace

Inner Beam (HH)

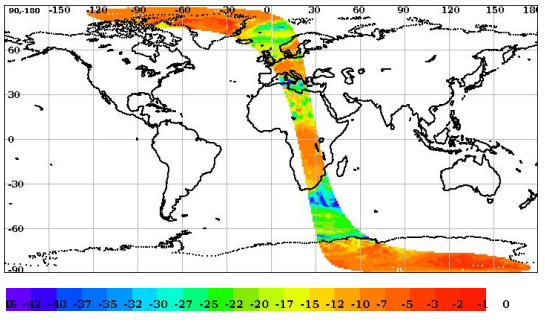


Outer Beam (VV)

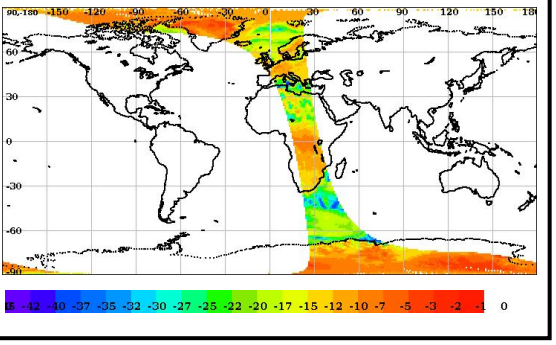


Sigma0(dB) Footprint trace

Inner Beam (HH)



Outer Beam (VV)



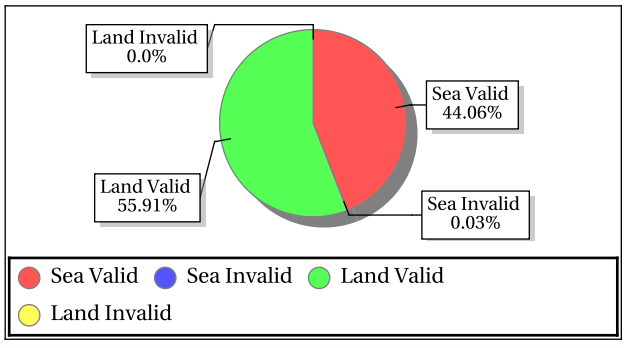
Invalid and Poor Sigma-0 Quality Flag Statistics for Inner/Outer Slices*

Sigma-0 Flags	Inner Beam	Outer Beam
Invalid Sigma0(%)	0.03	0.03
Data Not Available From Payload (%)	100.0	97.68638
Slice not within sample array limits (%)	0.00	2.31
C(S+N) - C(N) < 0.1 (%)	0.00	0.00
Poor Sigma0(%)	22.22	13.34
Noise samples for blending Saturated	0.0	0.020908
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 (%)	0.01627	0.060634

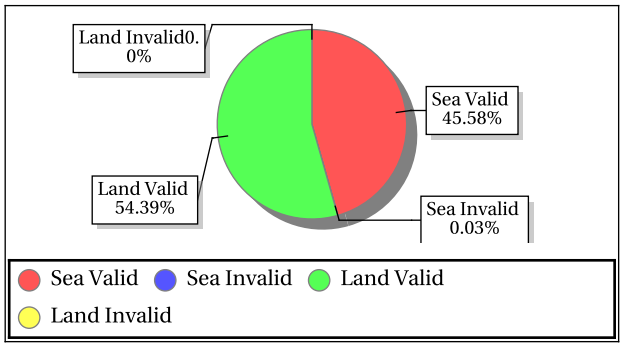
*DP Format Document

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
ANT_1	-75.00	121.00	Inner	ASC	Aft	-7.63	-5.92	-6.71	0.56	173.29	227.13	199.33	14.55
GreenLand_2	77.50	-41.50	Inner	ASC	Aft	-5.57	-4.33	-4.88	0.41	166.91	209.53	187.86	14.99
GreenLand_2	77.50	-41.50	Inner	ASC	Fore	-4.37	-3.88	-4.11	0.20	168.53	188.66	176.18	8.90
GreenLand_1	74.69	-42.50	Inner	ASC	Aft	-10.05	-8.00	-9.08	0.57	170.84	219.75	192.65	12.83
GreenLand_1	74.69	-42.50	Inner	ASC	Fore	-9.99	-7.74	-9.04	0.55	152.62	218.38	191.97	16.41
Sahara	19.10	14.30	Inner	ASC	Aft	-34.08	-21.23	-27.16	3.26	226.09	300.88	259.81	17.46
Sahara	19.10	14.30	Inner	ASC	Fore	-33.61	-21.54	-27.59	3.18	205.26	295.77	256.28	15.01
ANT_1	-75.00	121.00	Outer	ASC	Aft	-9.84	-7.27	-8.44	0.74	187.77	247.32	209.23	18.96
GreenLand_2	77.50	-41.50	Outer	ASC	Fore	-5.55	-4.49	-5.10	0.43	210.71	275.44	233.74	22.01
GreenLand_3	71.55	-42.45	Outer	ASC	Aft	-11.78	-9.98	-10.86	0.45	203.41	267.07	238.11	17.27
GreenLand_3	71.55	-42.45	Outer	ASC	Fore	-12.05	-9.88	-11.20	0.51	216.08	287.69	245.56	15.07
GreenLand_1	74.69	-42.50	Outer	ASC	Aft	-10.49	-8.30	-9.53	0.81	228.35	263.19	249.08	9.81
GreenLand_1	74.69	-42.50	Outer	ASC	Fore	-9.73	-7.74	-8.86	0.61	224.54	249.75	236.50	7.75
Sahara	19.10	14.30	Outer	ASC	Aft	-39.11	-20.44	-27.12	4.20	234.07	328.78	279.63	16.16
Sahara	19.10	14.30	Outer	ASC	Fore	-36.56	-19.38	-26.73	4.02	250.99	330.25	284.76	16.16

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	253.59	0.41	4.231	0.12	283.92	0.33	3.131	0.12	18.31	0.12	0.011	0.12	7.85	0.12	0.013
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	-34.18	22.36	5.45	0.014	-34.67	23.85	7.07	1.013	-22.74	30.20	17.96	12.266	-19.04	31.07	18.30	12.879

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	202.10	0.37	3.965	0.09	189.81	0.33	3.442	0.09	41.86	0.10	0.081	0.09	161.69	0.11	0.133
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	-34.36	15.57	2.85	0.000	-34.09	17.68	3.86	0.000	-27.51	22.26	11.82	0.005	-33.39	23.27	11.87	0.091

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)

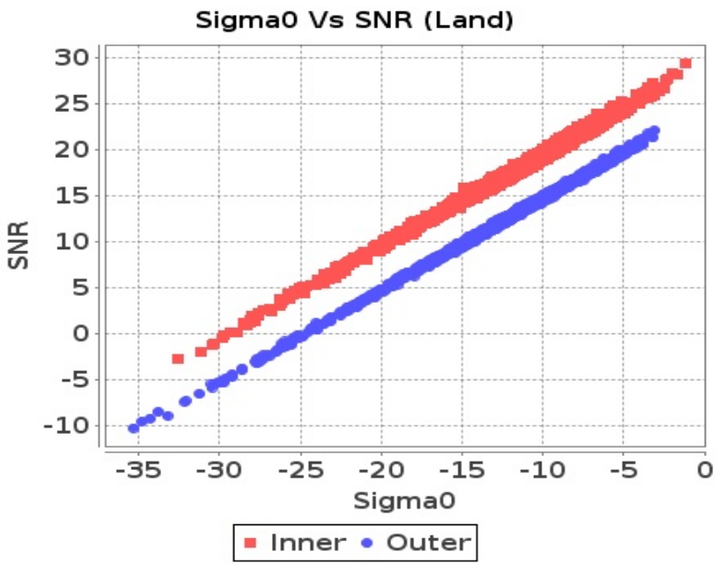
	Inner Beam (HH)				Outer Beam (VV)			
	Min	Max	Mean	Bad Occ. (%)	Min	Max	Mean	Bad Occ. (%)
Incidence Angle (deg)	48.75	49.41	49.06	0.000	57.48	58.25	57.95	0.000
Azimuth Diff. (deg)	0.0000	73.60	1.27	2.645	0.0000	293.01	1.27	3.947
Range(Km)	1030.06	1083.71	1051.01	0.000	1206.45	1273.30	1231.55	7.711
X Factor(dbm)	-91.44	-89.62	-90.23	0.000	-92.81	-91.66	-92.09	0.000
Across Distance (Km)	15.47	15.95	15.66	0.000	11.06	37.76	20.84	9.000
Along Distance (Km)	18.76	6252.10	31.96	2.000	18.66	6180.61	31.73	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

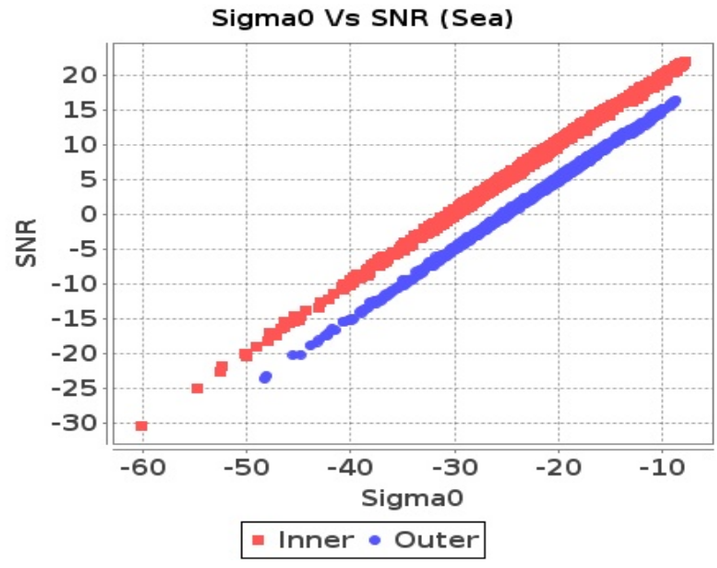
Normal
Deviations
Alarming
High Errors

Sigma0 Behaviour (Sigma0 Vs SNR)

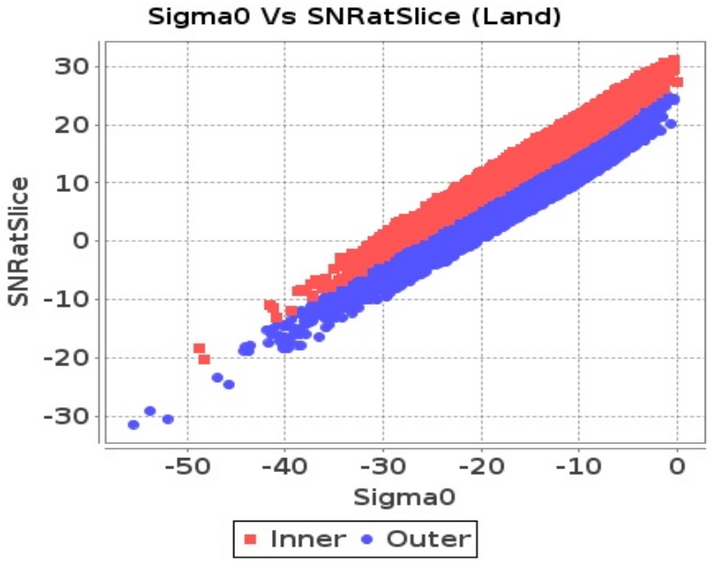
Footprint-Land



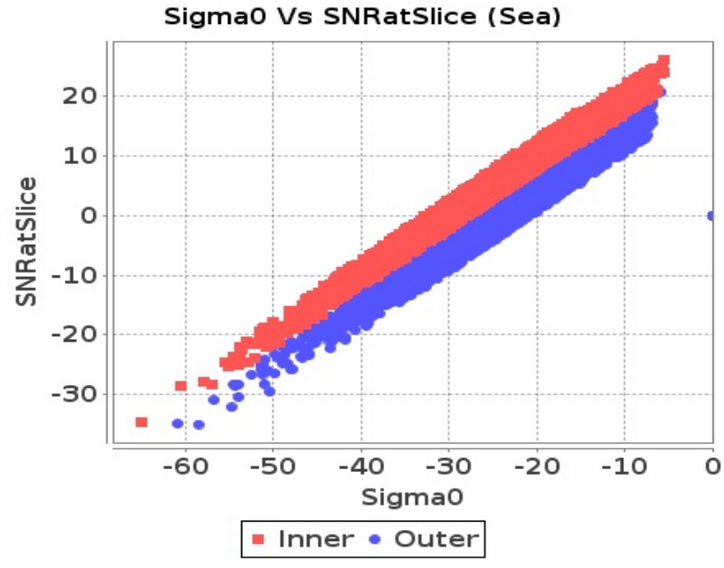
Footprint-Sea



Slice-Land

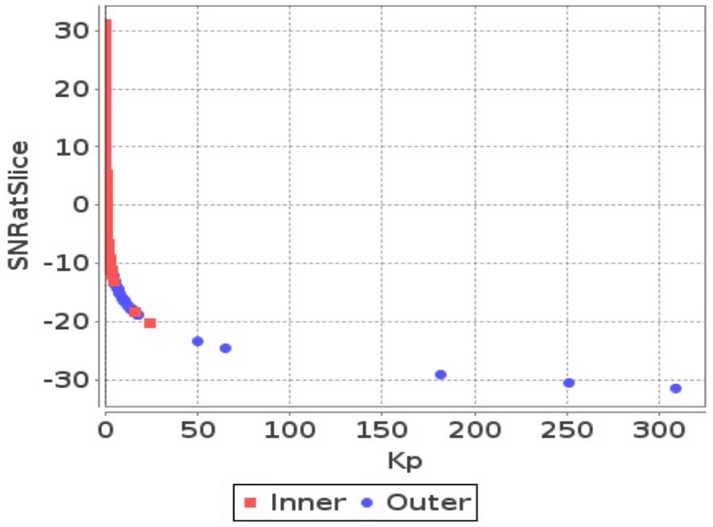


Slice-Sea

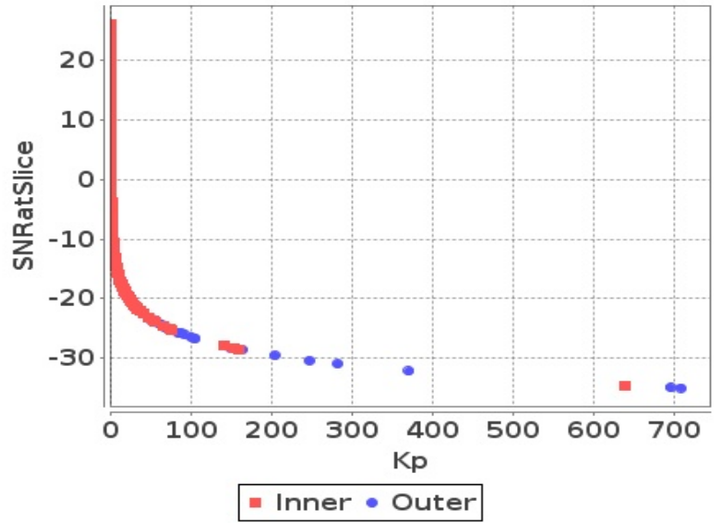


Sigma0 Behaviour (Kp Vs SNR)

Slice

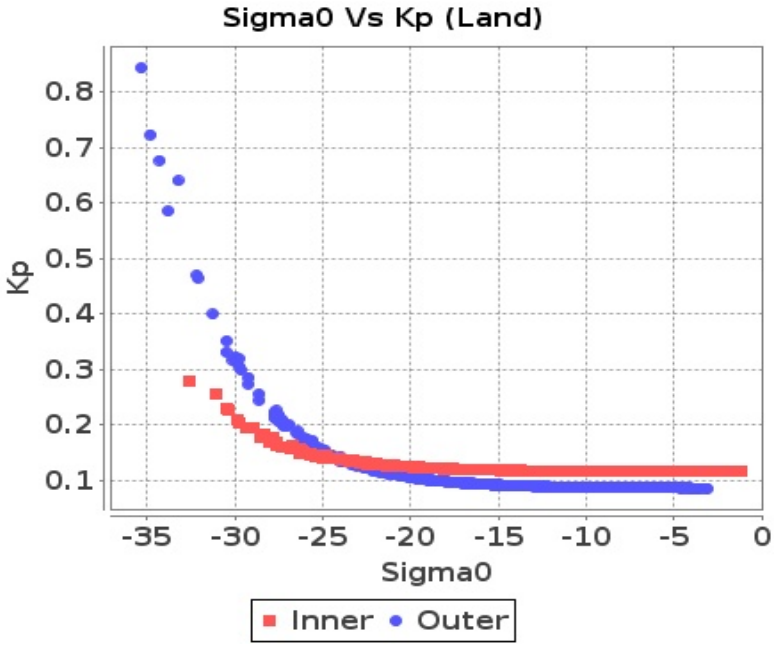


Slice

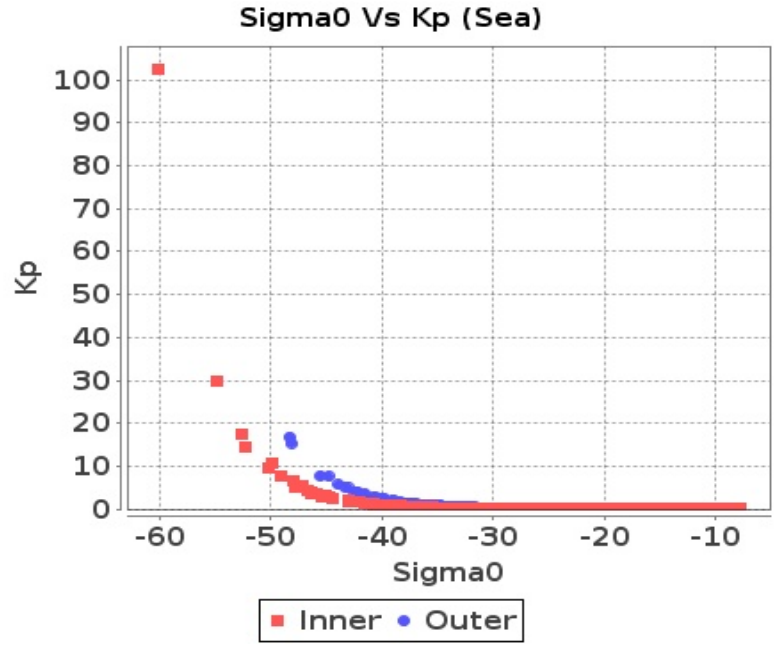


Sigma0 Behaviour(Sigma0 Vs Kp)

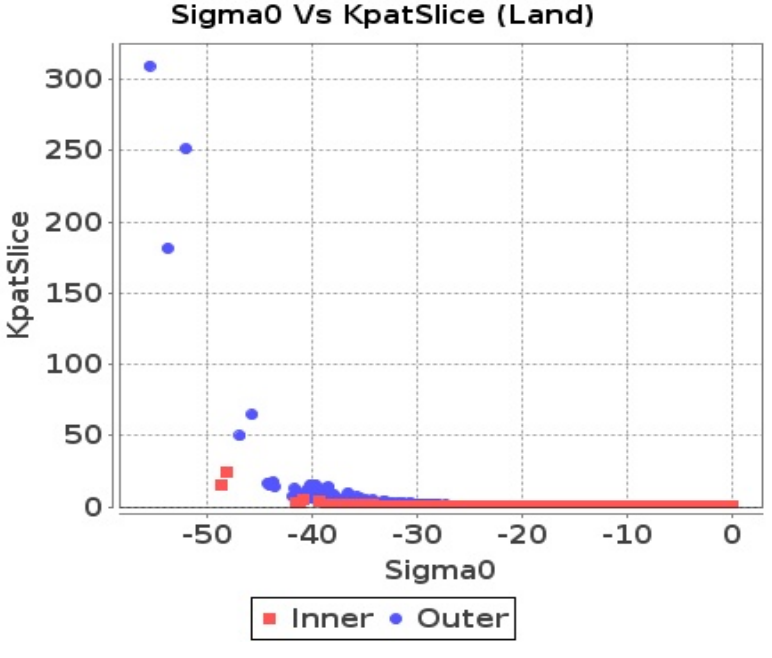
Footprint-Land



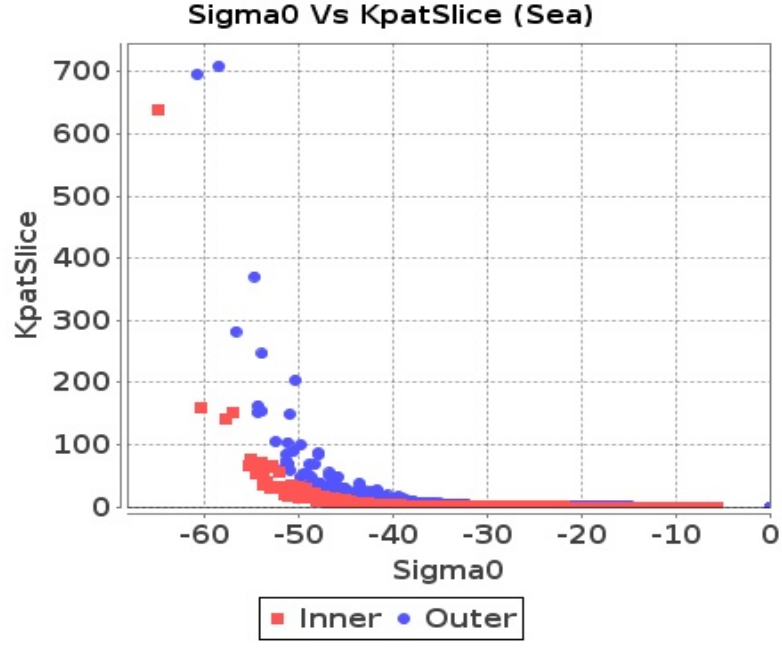
Footprint-Sea



Slice-Land



Slice-Sea

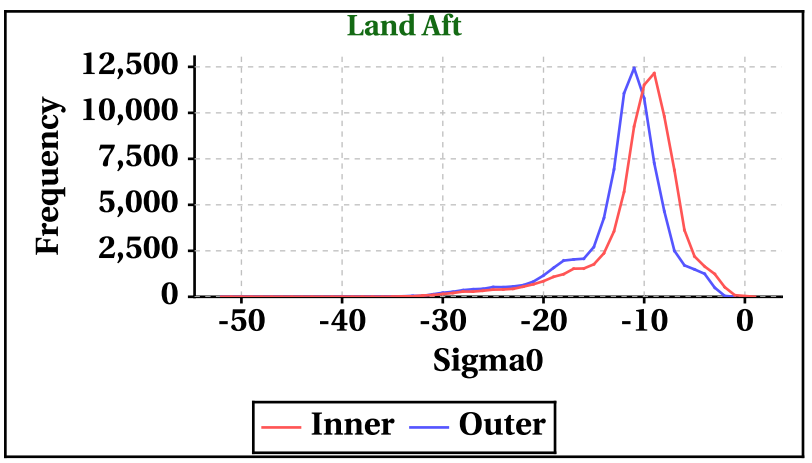


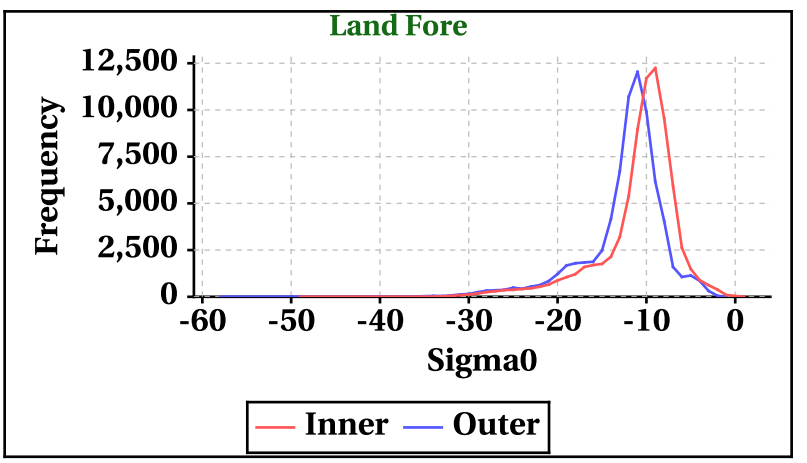
Dynamic Range (Data Histograms)

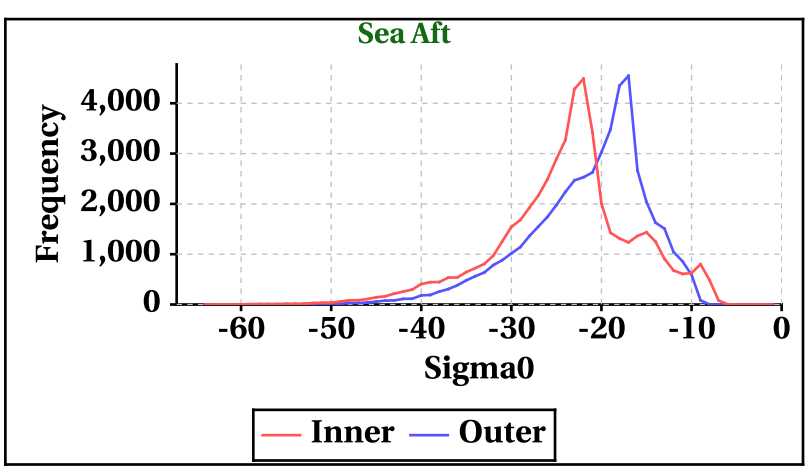
Sigma0(db)

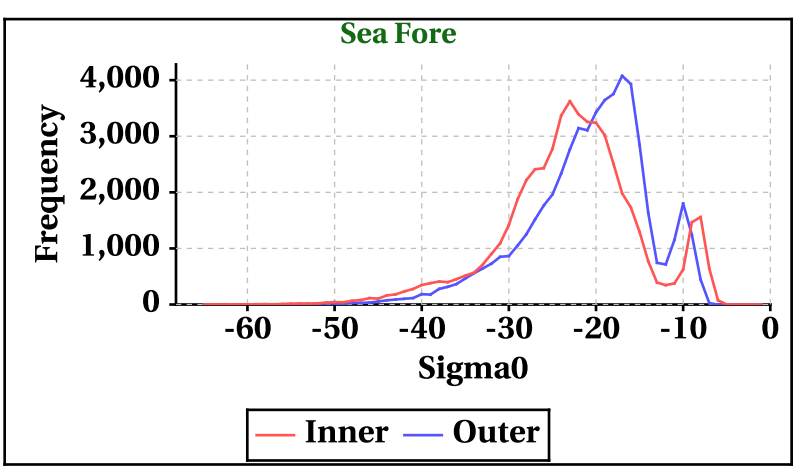
Inner Beam (HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-52	-49	-64	-65
Max	1	1	0	0

Outer Beam (VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-52	-58	-59	-59
Max	0	0	0	0





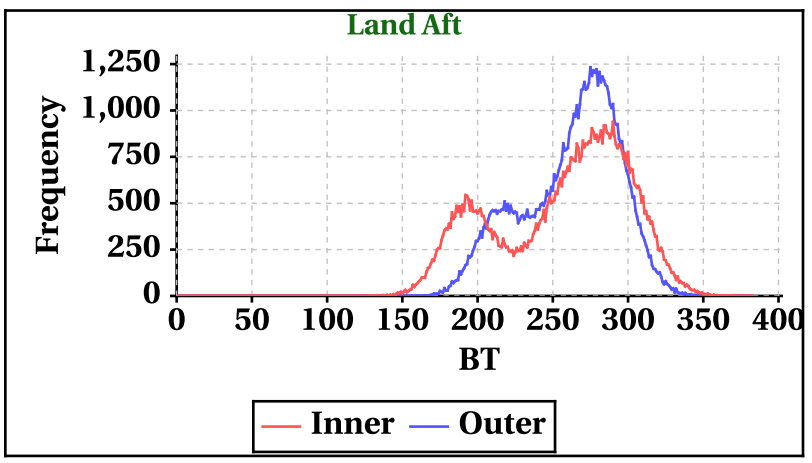


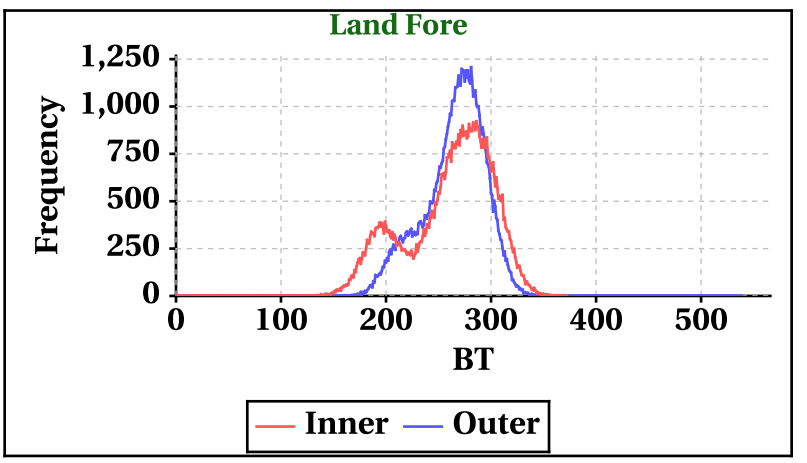


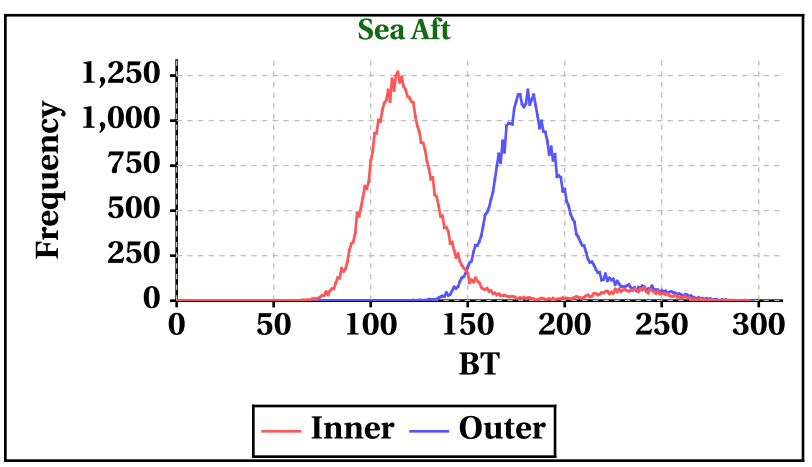
Brightness Temperature(K)

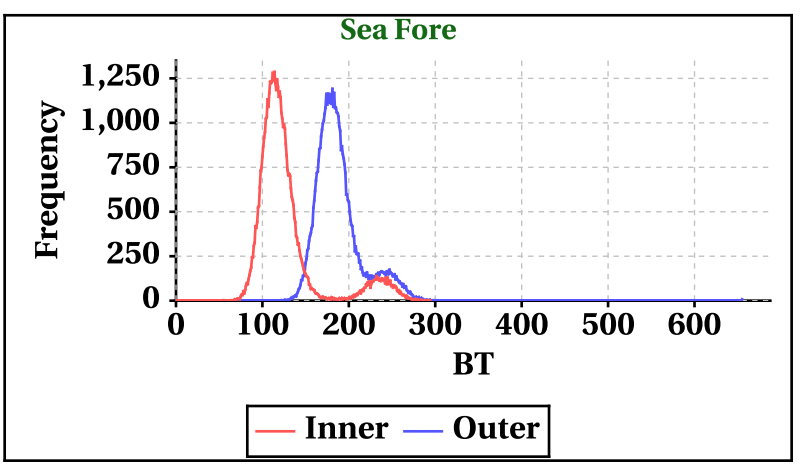
Inner Beam(HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	0	0
Max	383	372	295	294

Outer Beam(VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	0	0
Max	382	539	297	655







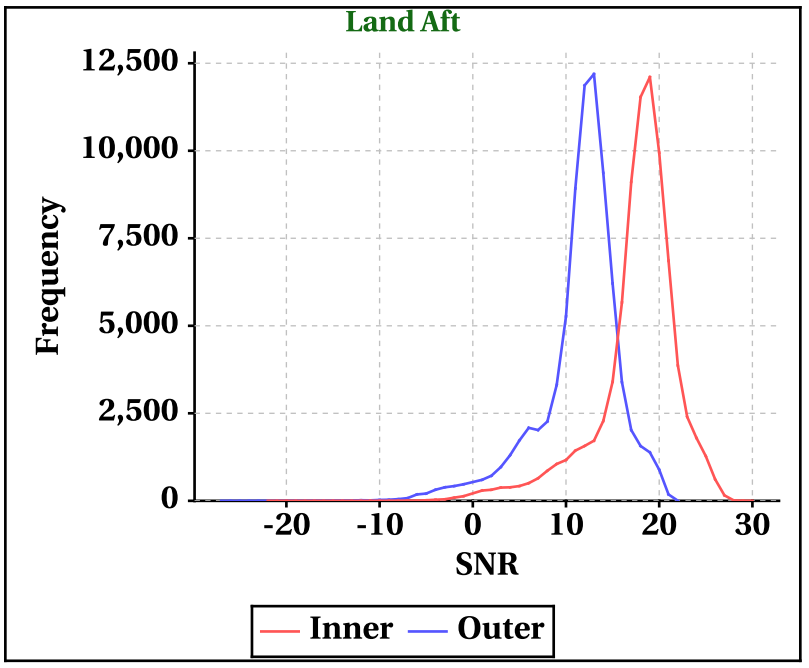


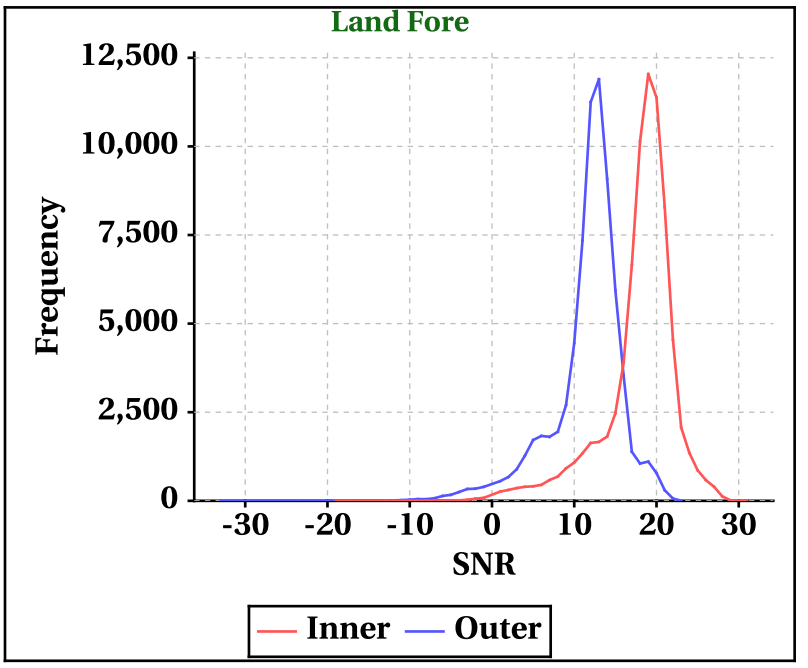
Dynamic Range (Data Histograms)

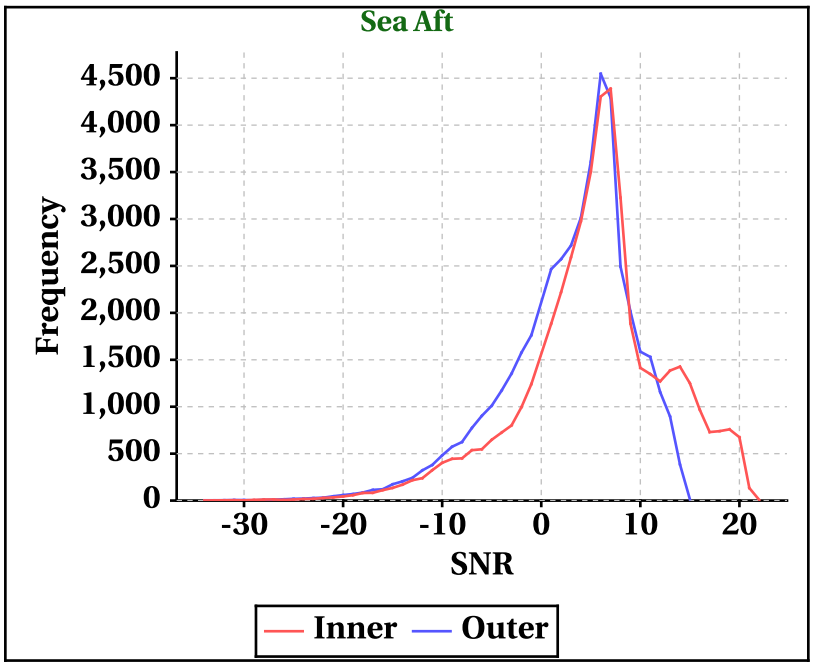
SNR(dBm)

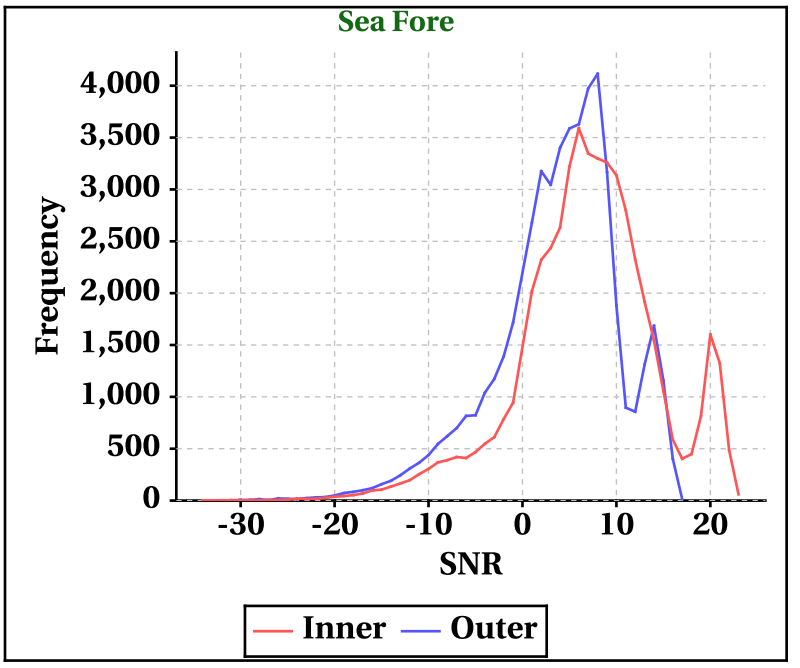
Inner Beam (HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-22	-19	-34	-34
Max	30	31	22	23

Outer Beam (VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-27	-33	-34	-34
Max	22	23	15	17



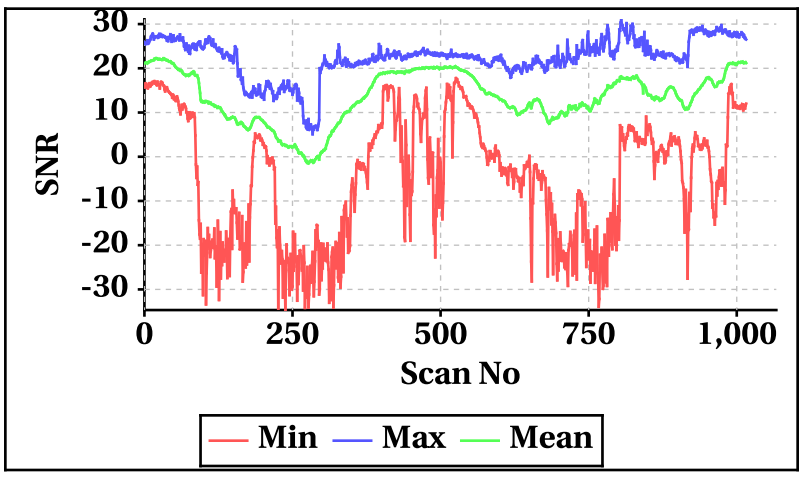




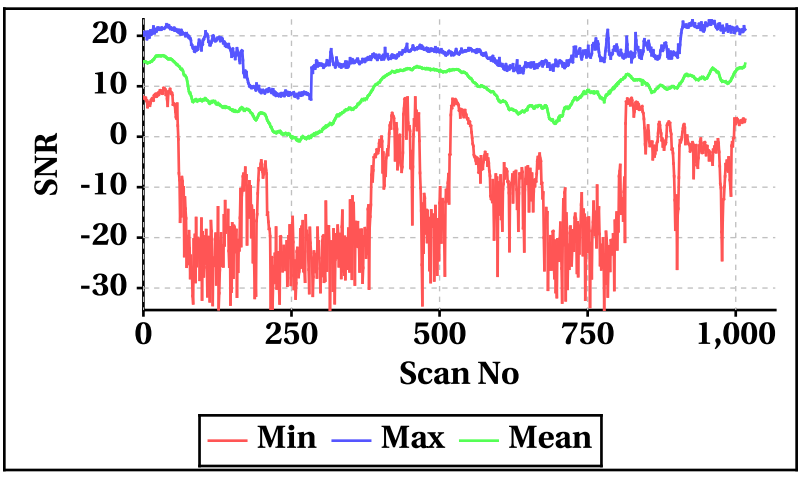


Orbit-wise behaviour of SNR

Inner Beam (HH)

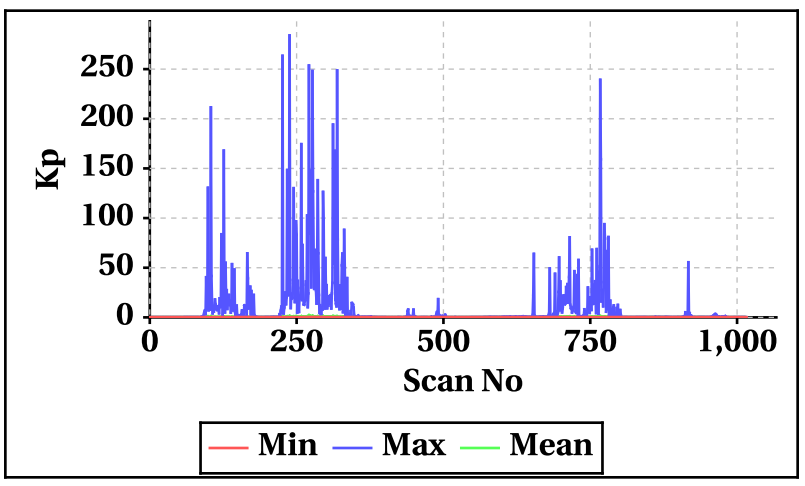


Outer Beam(VV)

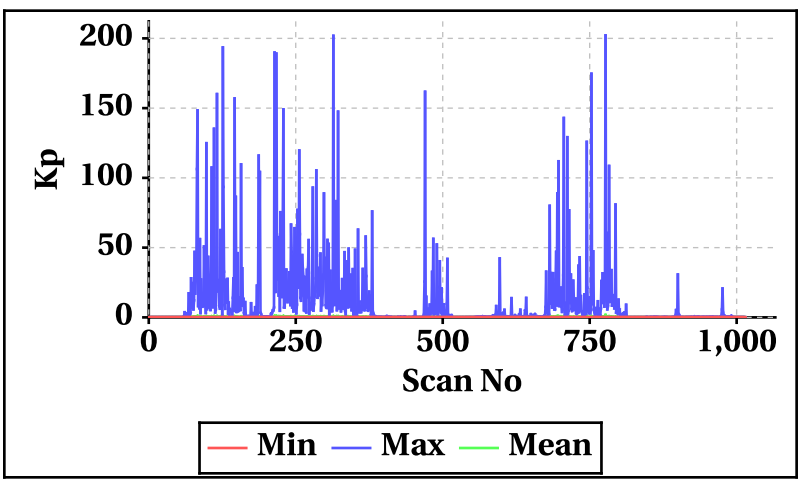


Orbit-wise behaviour of Kp,Kpa,Kpb,Kpc

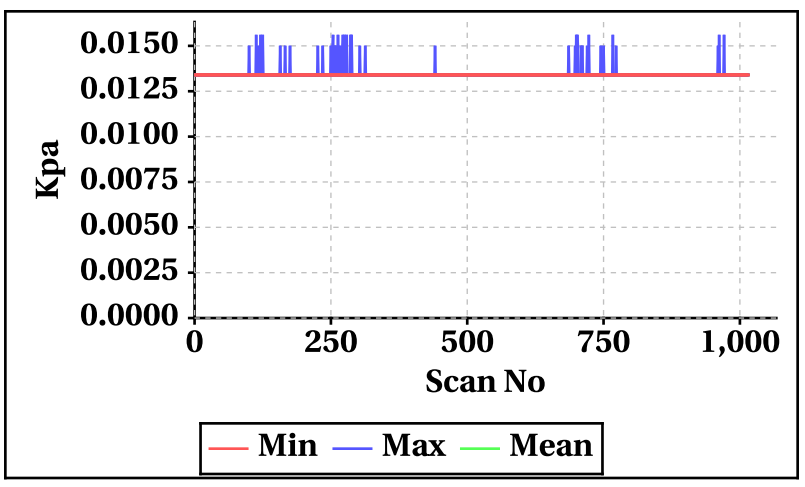
Inner Beam(HH)



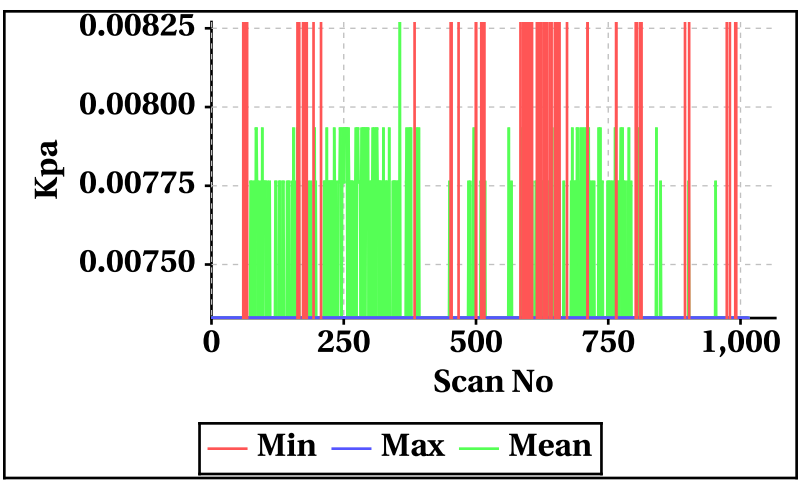
Outer Beam(VV)



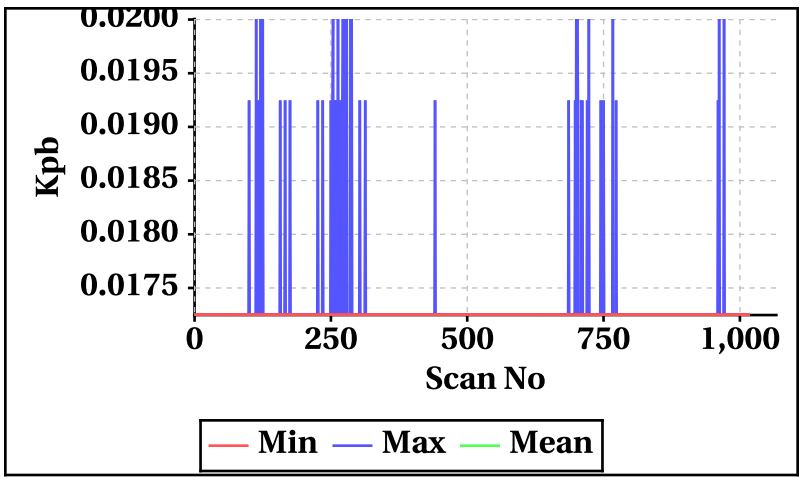
Inner Beam(HH)



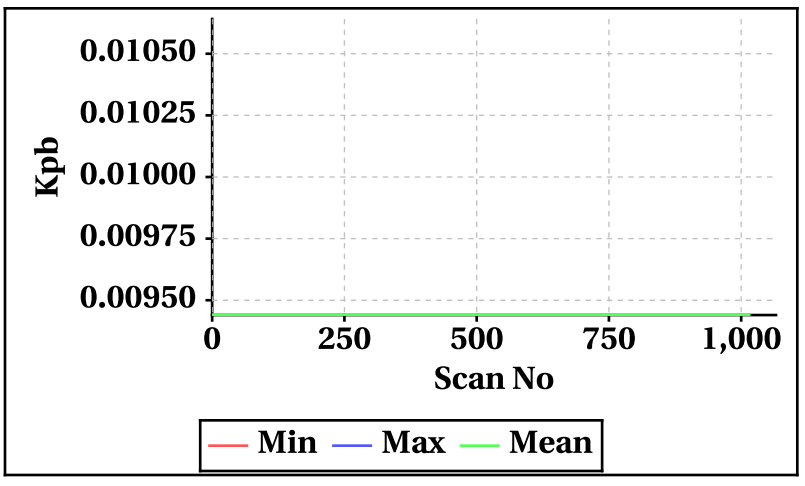
Outer Beam(VV)



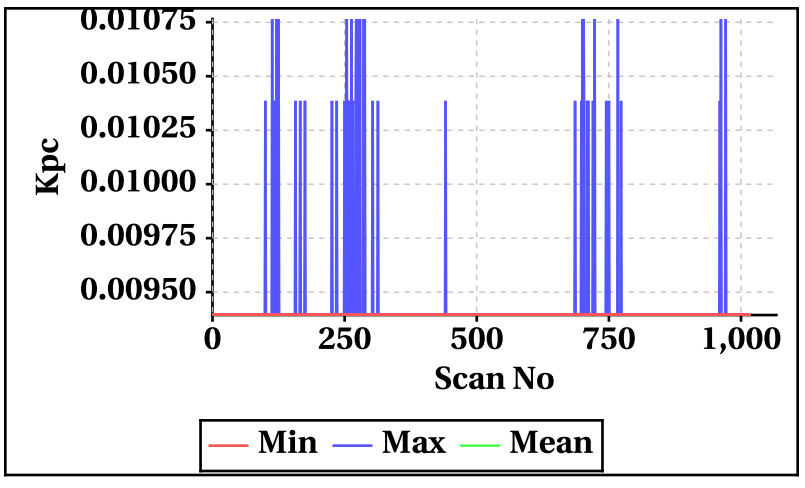
Inner Beam(HH)



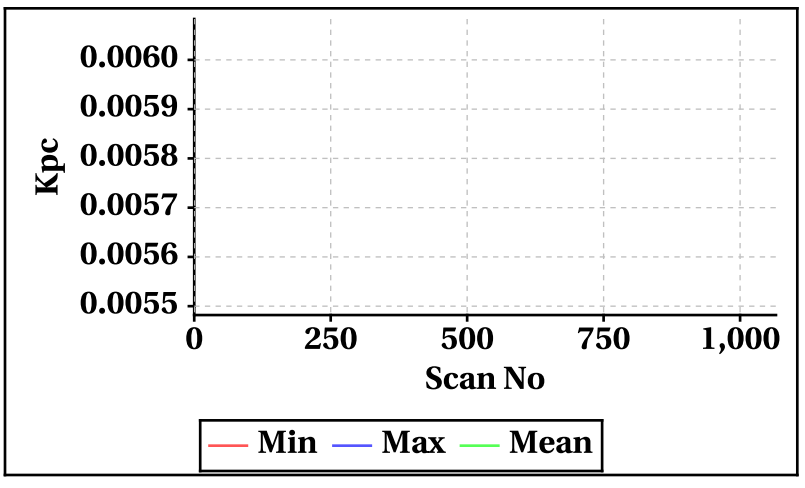
Outer Beam(VV)



Inner Beam(HH)

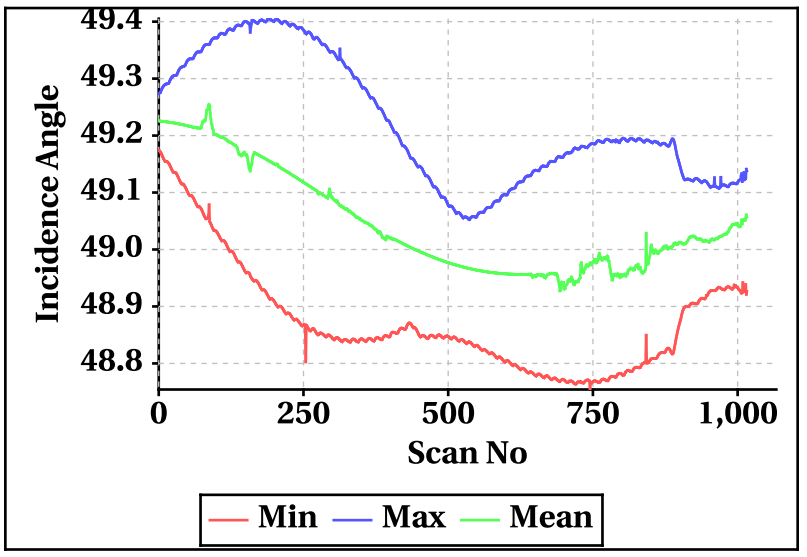


Outer Beam(VV)

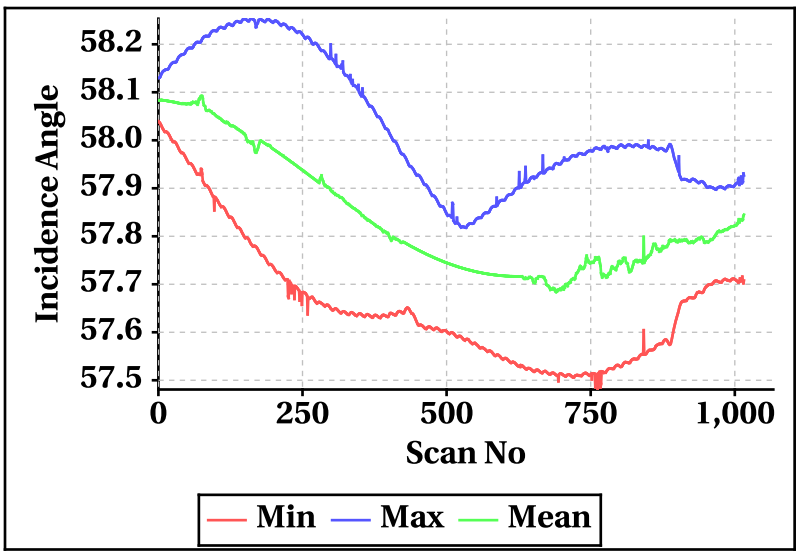


Orbit-wise behaviour of Incidence,Azimuth,Range,X-Factor

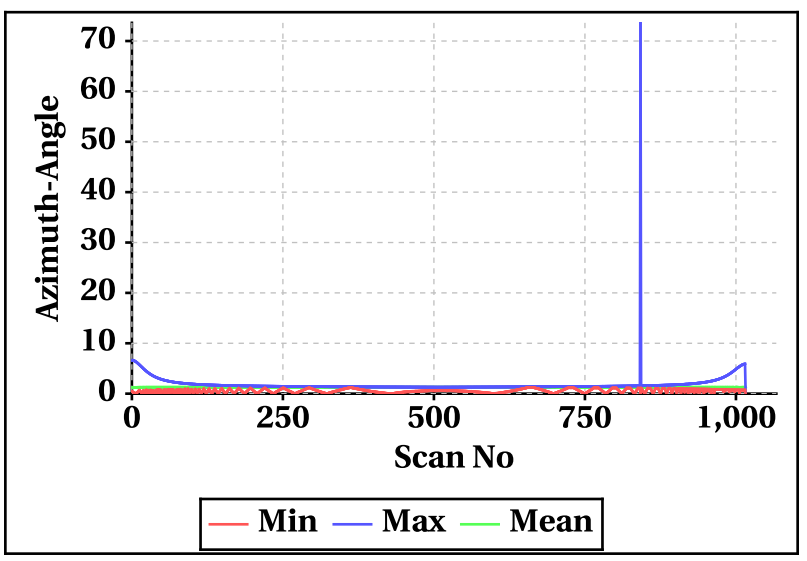
Inner Beam (HH)



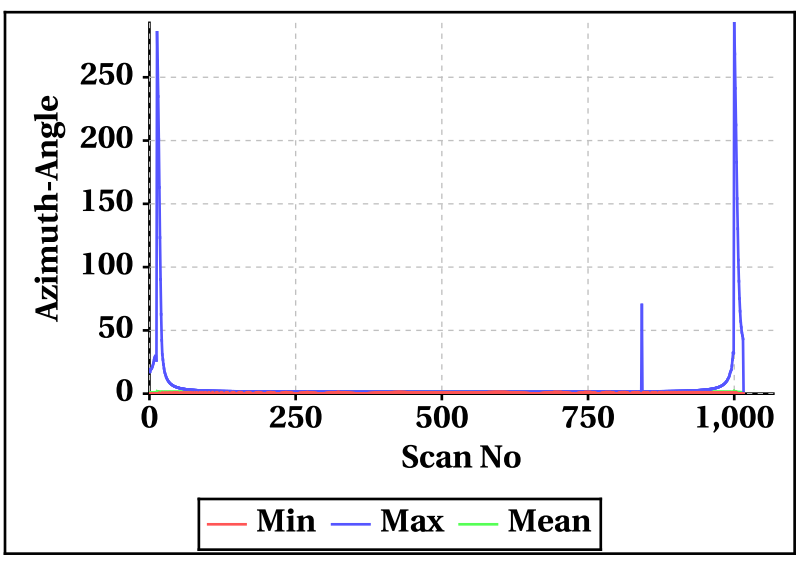
Outer Beam(VV)



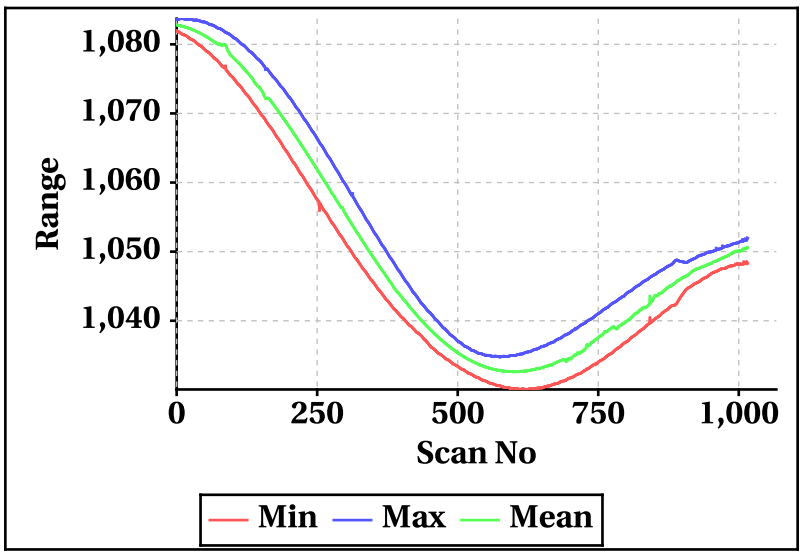
Inner Beam (HH)



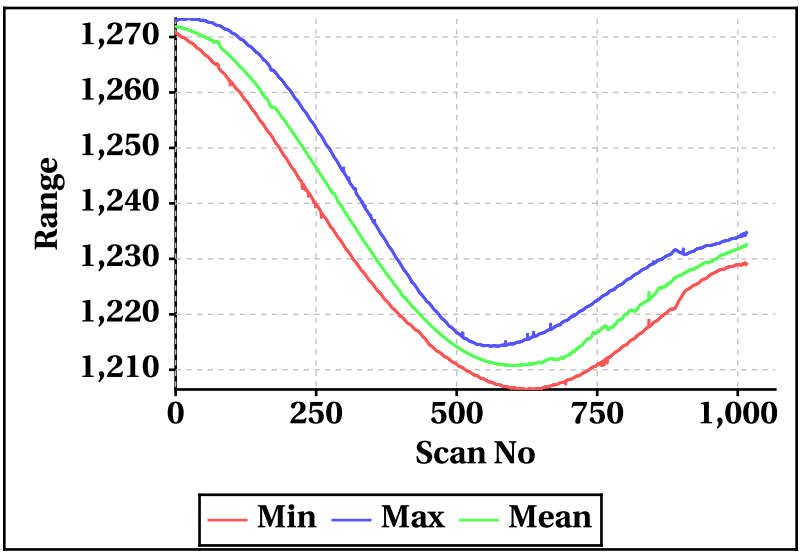
Outer Beam(VV)



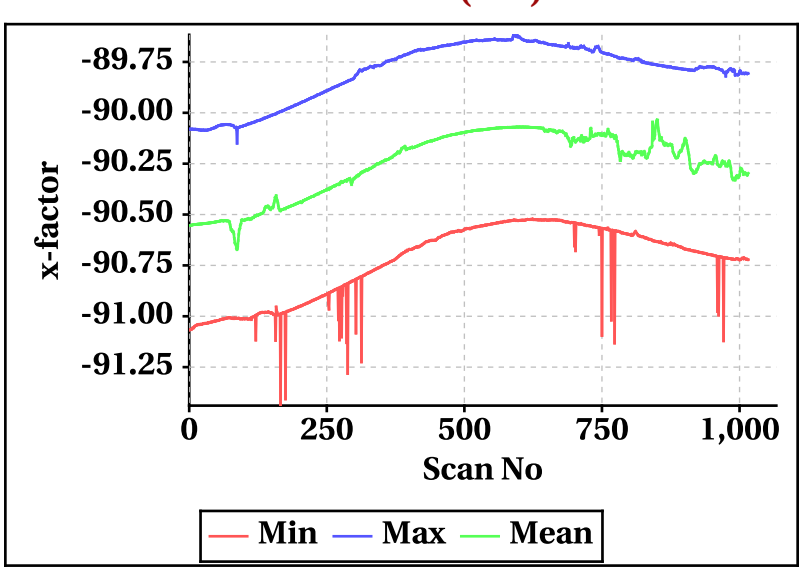
Inner Beam (HH)



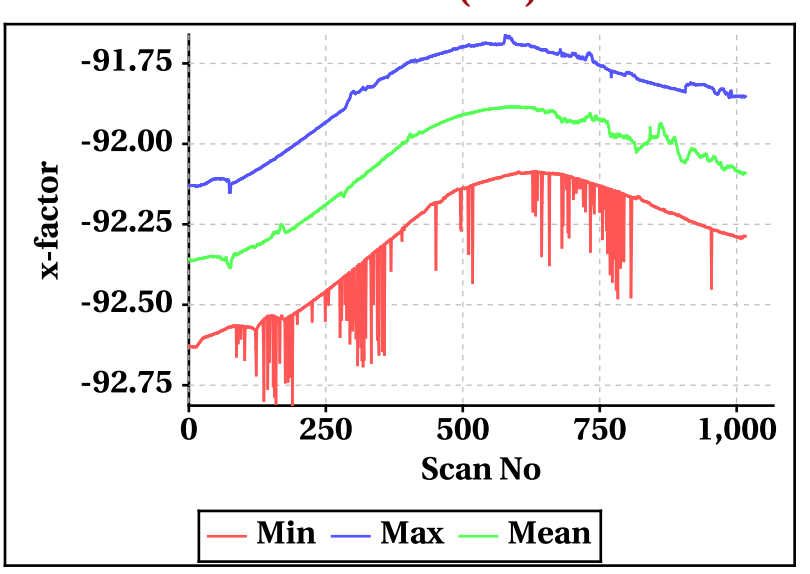
Outer Beam(VV)



Inner Beam (HH)



Outer Beam(VV)



Doppler Frequency Variation

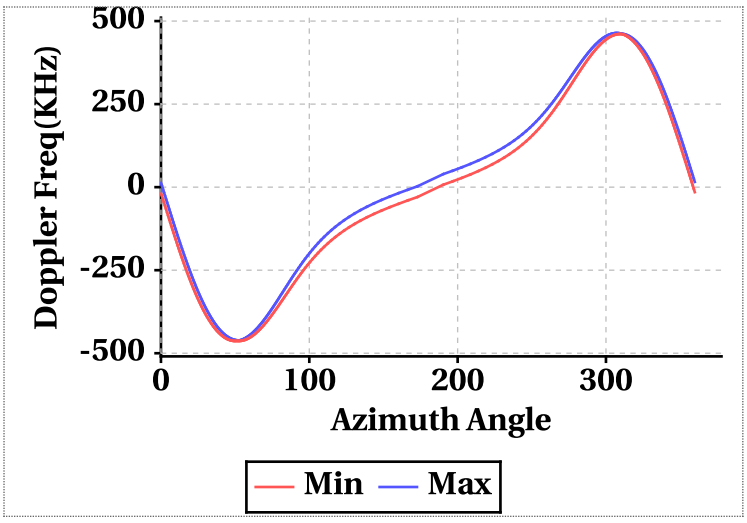
Doppler Frequency(KHz) variation statistics Over the half Orbit

	Inner Beam (HH)	Outer Beam (VV)
Min	-463.10	-519.08
Max	463.92	519.82

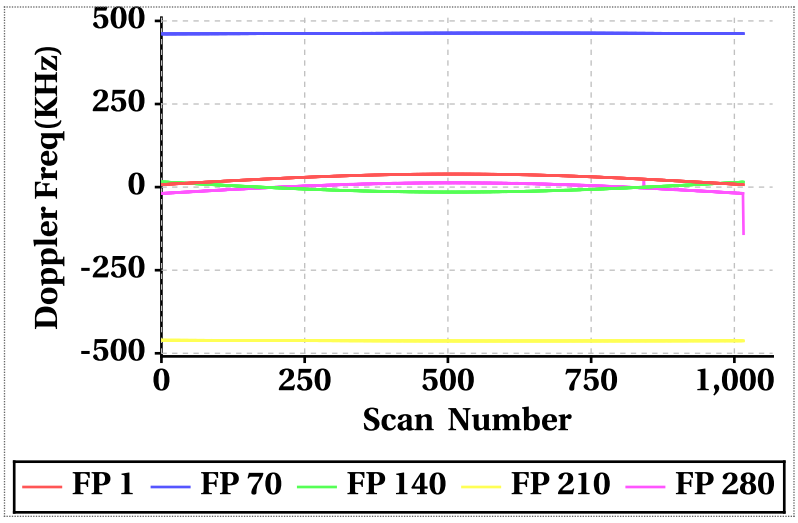
Doppler Frequency(KHz) variation

	Inner Beam (HH)			Outer Beam (VV)		
Doppler_FP	Min	Max	Mean	Min	Max	Mean
Doppler_1	7.28	39.26	27.69	2.64	38.24	25.35
Doppler_70	460.90	463.48	462.55	516.42	519.54	518.45
Doppler_140	-15.00	15.74	-3.91	-22.78	11.80	-10.28
Doppler_210	-463.02	-460.64	-462.37	-518.90	-516.48	-518.23
Doppler_280	-140.28	18.66	1.15	-151.48	21.00	7.12

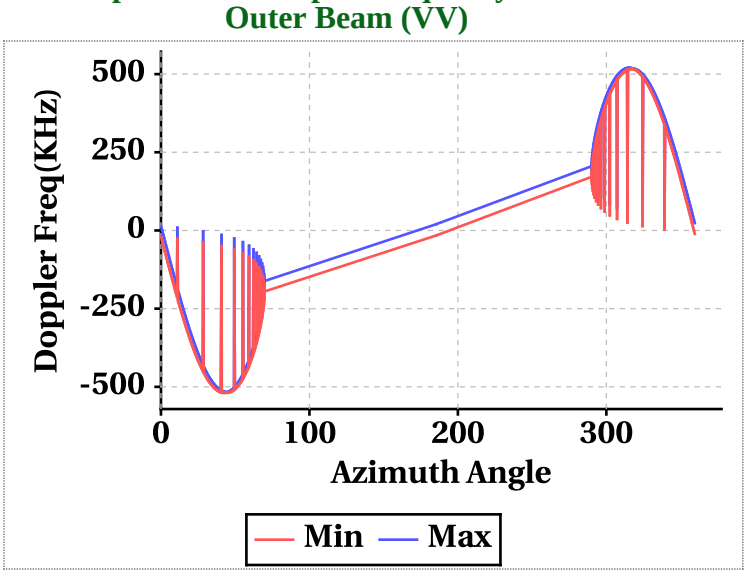
Footprint wise Doopler frequency variation Inner Beam (HH)



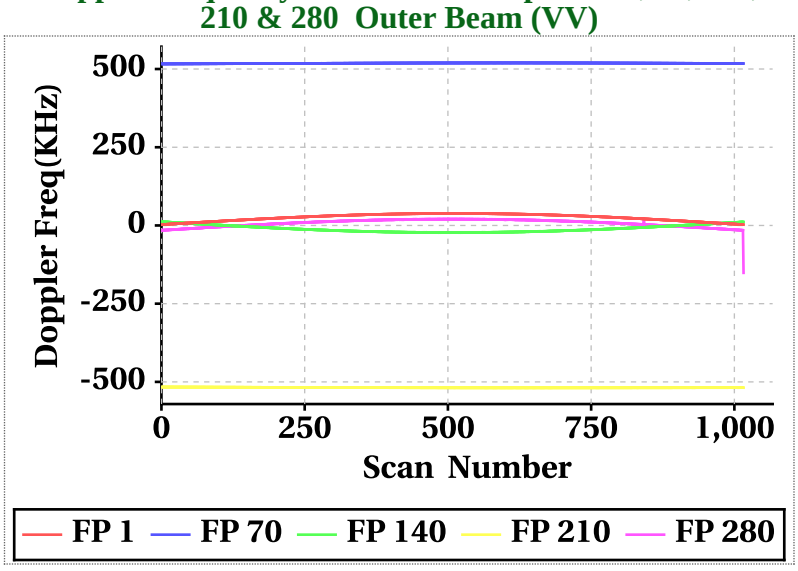
Doppler frequency variation at footprints: 1, 70, 140, 210 & 280 Inner Beam (HH)



Footprint wise Doopler frequency variation Outer Beam (VV)

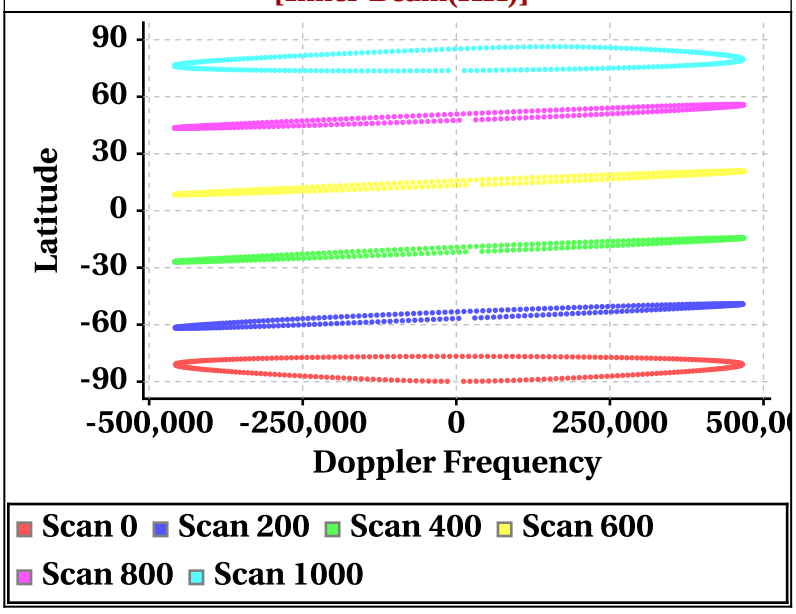


Doppler frequency variation at footprints: 1, 70, 140, 210 & 280 Outer Beam (VV)

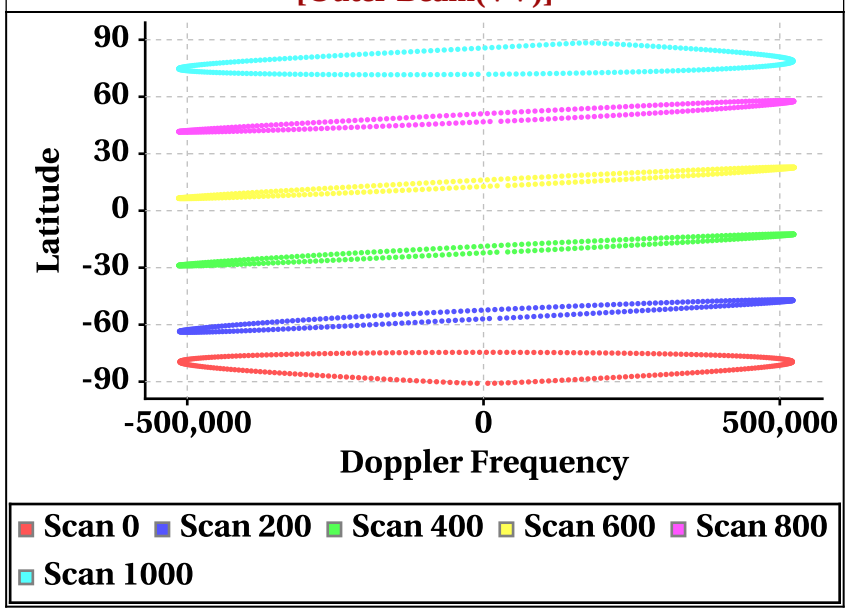


Latitude Vs Doppler Frequency

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



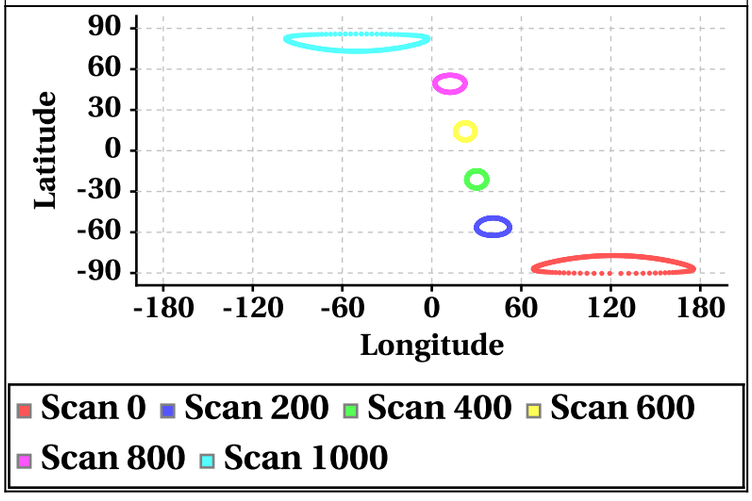
Doppler Frequency at Scan Interval of 200 [Outer Beam(VV)]



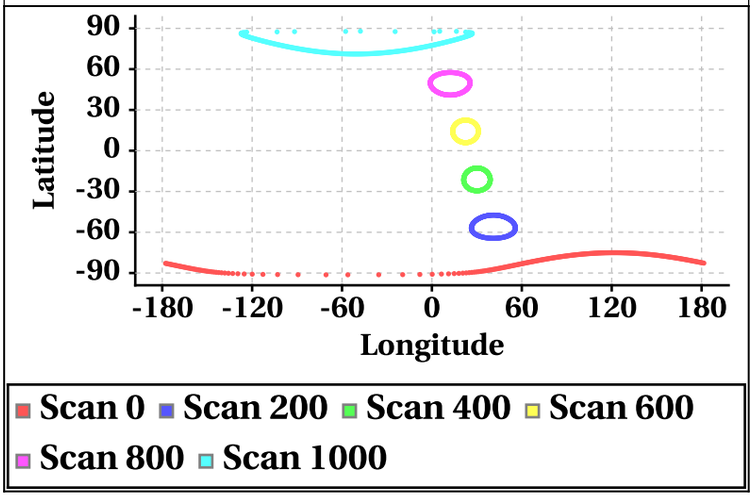
Parameter as a function of Latitude

Latitude Vs Longitude

Scan Trace [Inner Beam(HH)]

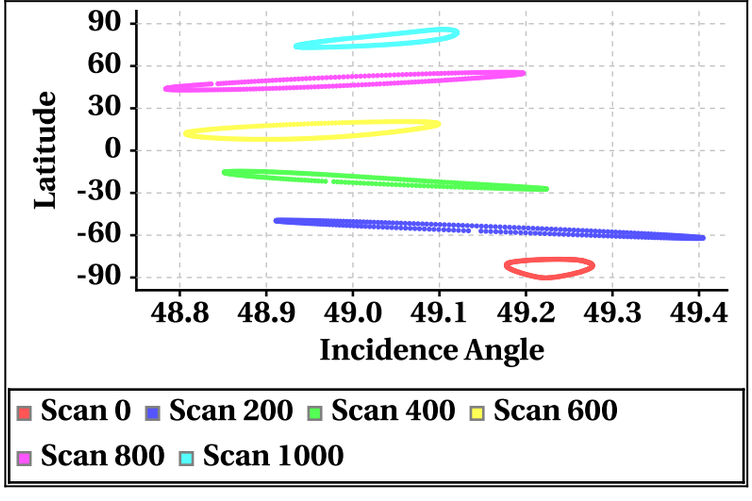


Scan Trace [Outer Beam (VV)]

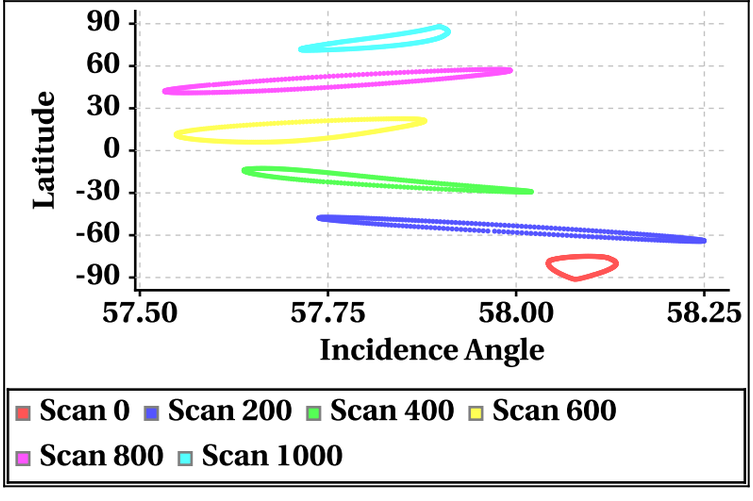


Latitude Vs Incidence Angle

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

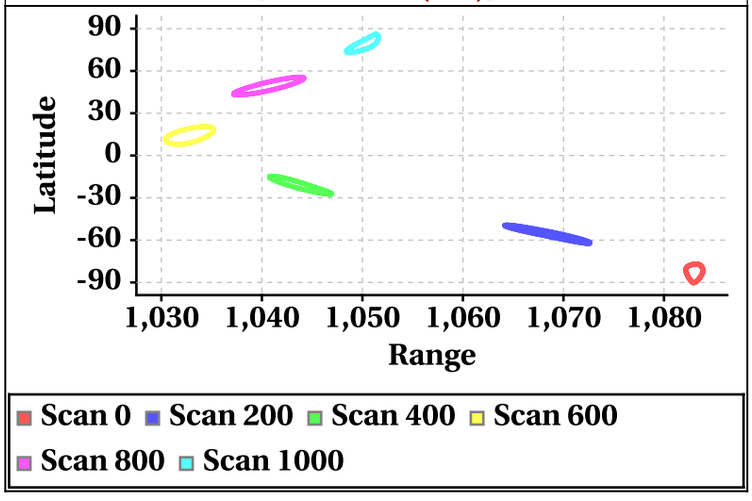


Incidence Angle at Scan Interval of 200 [Outer Beam (VV)]

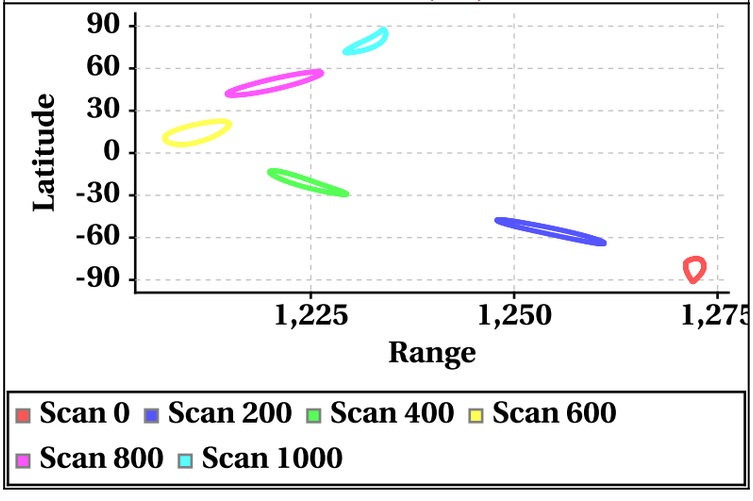


Latitude Vs Range

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



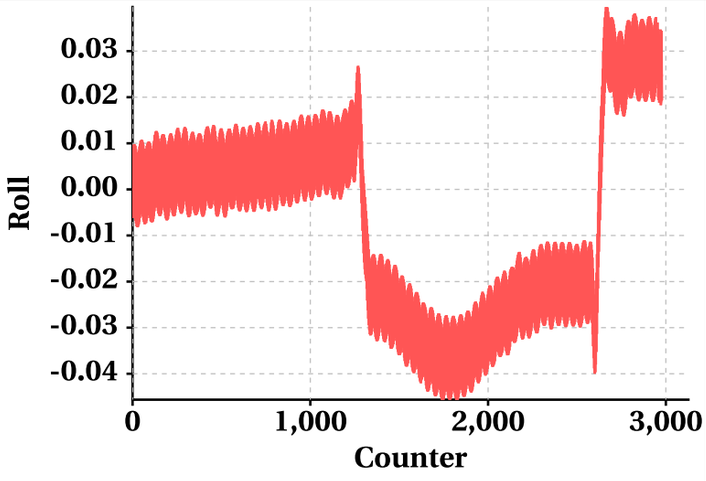
Range at Scan Interval of 200 [Outer Beam(VV)]



Variation in Orbit and Attitude Parameters

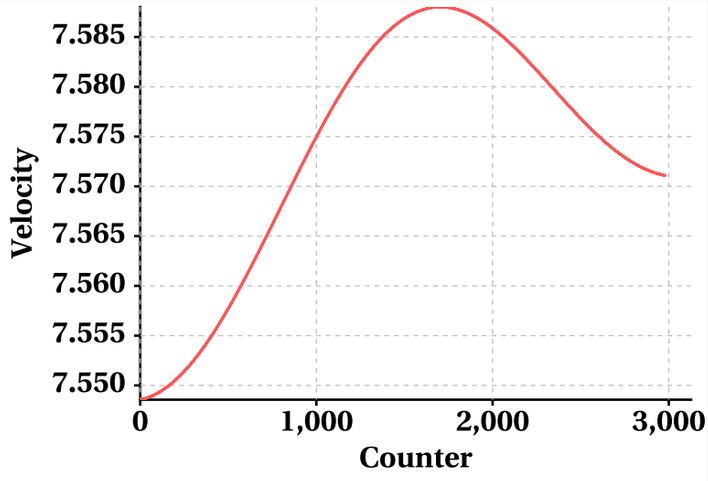
Roll

Min Roll(deg)	-0.045625
Max Roll(deg)	0.039574



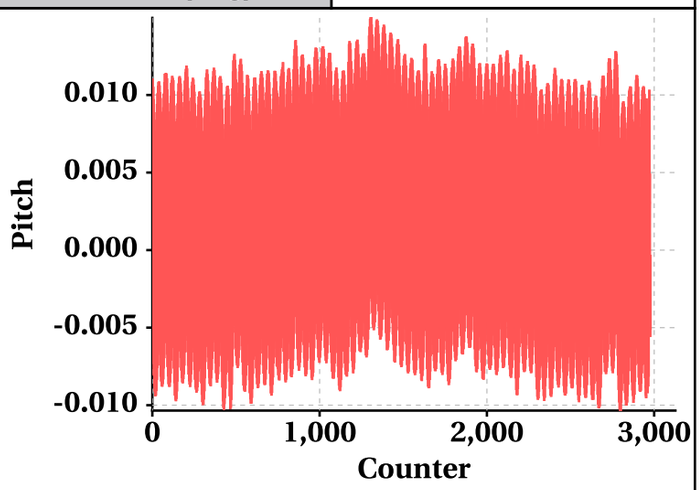
Velocity

Min Velocity(km/s)	7.548565
Max Velocity(km/s)	7.588017



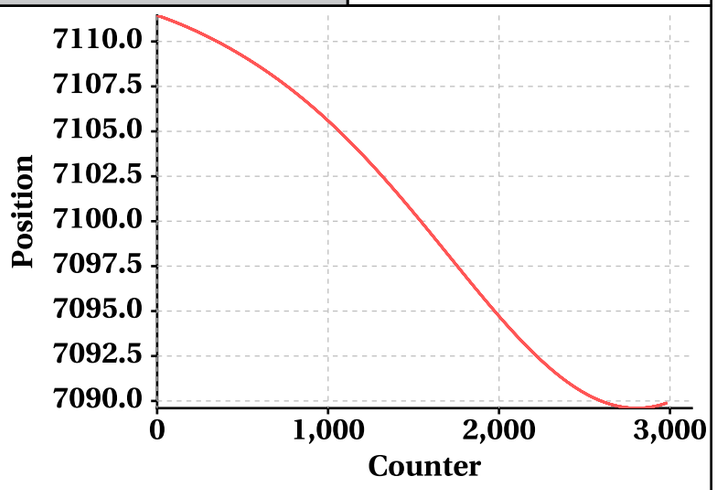
Pitch

Min Pitch(deg)	-0.010348
Max Pitch(deg)	0.014971



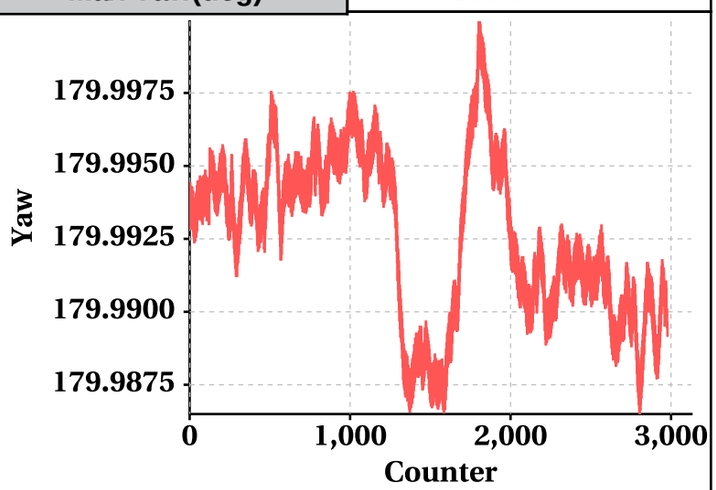
Position

Min Position(km)	7089.599609
Max Position(km)	7111.447754



Yaw

Min Yaw(deg)	179.986496
Max Yaw(deg)	179.999954



TimeDifference

Min TimeDifference	1.0
Max TimeDifference	1.0