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

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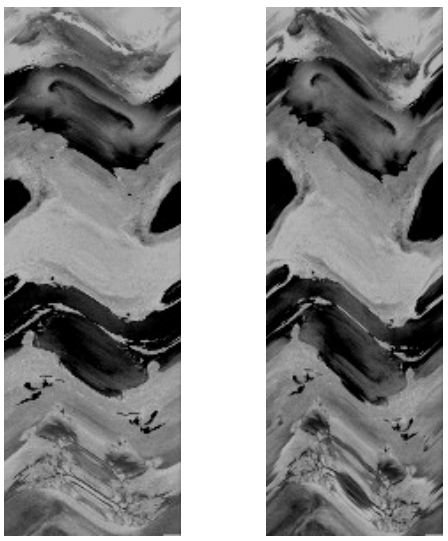
Half Orbit OAT Behaviour

Image Snapshot for Inner & Outer Beam

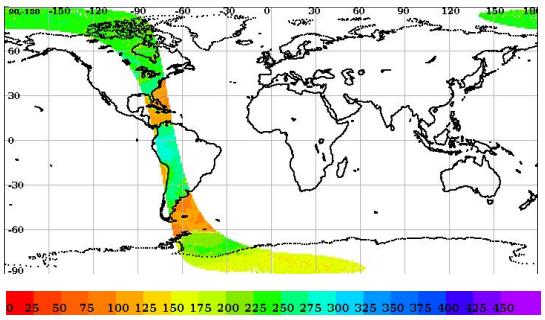
Inner (HH) **Outer (VV)**



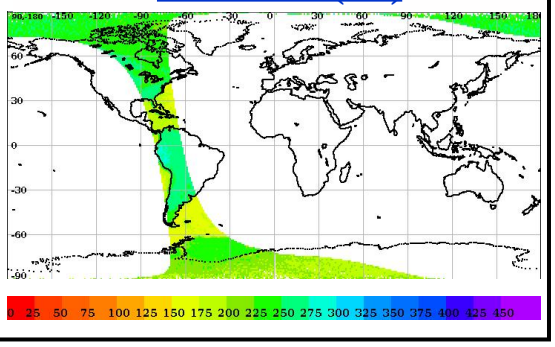
Satellite Id	ScatSat-1	**Start Orbit**	3202	**Total Scans**	1006
Sensor Name	Scatterometer	**End Orbit**	3203	**No of Inner FootPrints**	281
Processor Version	v1.1.2	**Rev. Number**	03202_03203	**No Of Outer FootPrints**	282
Half Orbit Direction	SN	**Data Production Date**	05-05-2017	**No. Of Inner Slices**	9
Equator Crossing Date	05-05-2017	**Equator Crossing Time**	01:39:01.000	**No Of Outer Slices**	14

Brightness Temprature(k) Footprint trace

Inner Beam (HH)

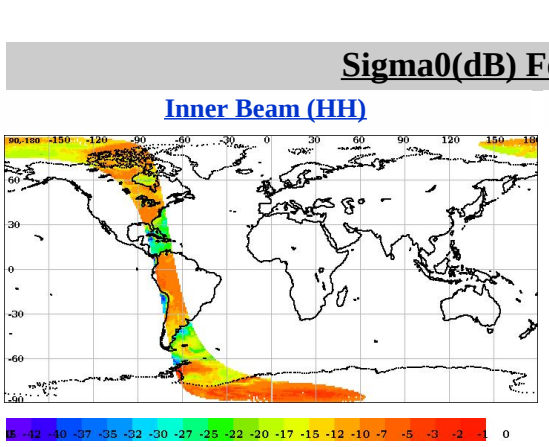


Outer Beam (VV)

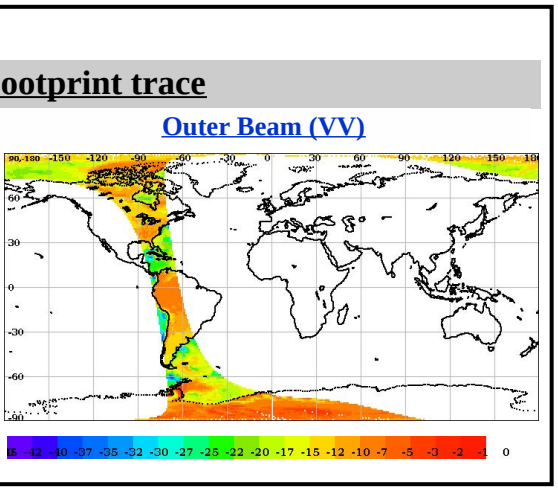


Sigma0(dB) Footprint trace

Inner Beam (HH)



Outer Beam (VV)



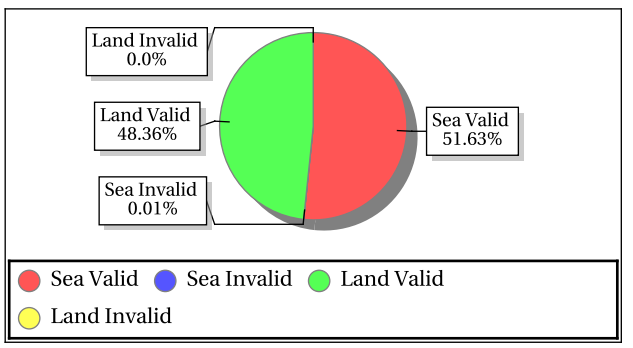
Invalid and Poor Sigma-0 Quality Flag Statistics for Inner/Outer Slices*

Sigma-0 Flags	Inner Beam	Outer Beam
Invalid Sigma0(%)	0.01	0.01
Data Not Available From Payload (%)	100.0	100.0
Slice not within sample array limits (%)	0.00	0.00
C(S+N) - C(N) < 0.1 (%)	0.00	0.00
Poor Sigma0(%)	0.00	0.00
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

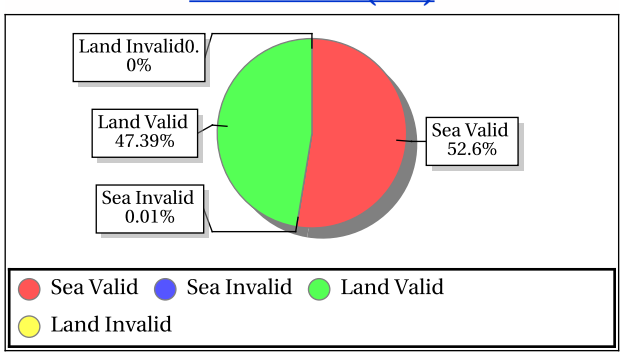
*DP Format Document

Sigma-0 Quality Flag Statistics for Inner/Outer Footprints

Inner Beam (HH)



Outer Beam (VV)



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
Amazon_1	0.00	-67.00	Inner	DSC	Aft	-8.86	-6.92	-7.89	0.60	244.51	320.04	276.73	16.01
Amazon_1	0.00	-67.00	Inner	DSC	Fore	-9.10	-6.35	-7.58	0.50	245.33	300.89	274.37	15.60
Amazon_3	-6.00	-61.00	Outer	DSC	Aft	-10.63	-8.80	-9.72	0.46	220.98	306.25	273.25	16.60
Amazon_3	-6.00	-61.00	Outer	DSC	Fore	-11.11	-8.82	-9.69	0.48	228.78	314.75	268.46	15.86
Amazon_1	0.00	-67.00	Outer	DSC	Aft	-9.60	-7.77	-8.68	0.44	237.62	311.48	270.71	17.98
Amazon_1	0.00	-67.00	Outer	DSC	Fore	-9.09	-7.44	-8.49	0.36	231.77	301.38	266.36	14.62

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	190.17	0.24	1.861	0.10	235.51	0.20	1.344	0.10	18.79	0.11	0.071	0.10	73.37	0.11	0.061
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	0.02	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	-33.52	26.44	8.20	0.557	-34.45	27.03	9.31	2.021	-23.45	33.67	18.97	10.166	-29.38	31.89	19.91	21.521

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	212.17	0.22	1.755	0.08	216.60	0.19	1.320	0.08	57.07	0.09	0.031	0.08	60.72	0.09	0.035
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	0.01	0.00	0.000	0.00	0.01	0.00	0.000
SNR	-34.88	20.55	4.61	0.000	-34.97	21.59	5.20	0.000	-29.17	23.42	13.58	0.161	-29.44	24.32	13.96	0.276

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)

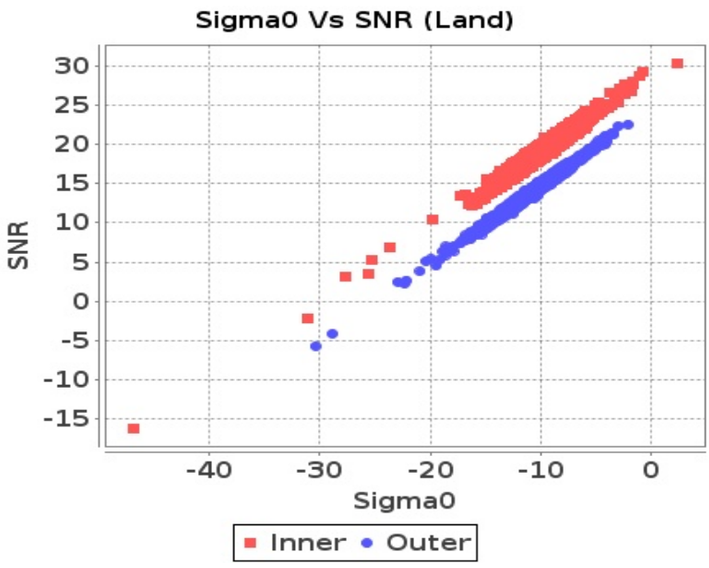
	Inner Beam (VV)				Outer Beam (VV)			
	Min	Max	Mean	Bad Occ. (%)	Min	Max	Mean	Bad Occ. (%)
Incidence Angle (deg)	48.85	49.34	49.04	0.000	57.67	58.21	57.98	0.000
Azimuth Diff. (deg)	0.0026	1.81	1.09	0.150	0.0027	1.97	1.09	0.214
Range(Km)	1041.11	1072.25	1054.63	0.000	1221.75	1260.73	1238.42	0.000
X Factor(dbm)	-91.90	-89.17	-90.46	0.000	-93.45	-91.72	-92.39	0.000
Across Distance (Km)	15.73	16.26	15.95	0.000	20.72	22.33	21.02	1.000
Along Distance (Km)	18.91	20.41	19.73	0.000	18.97	20.33	19.64	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

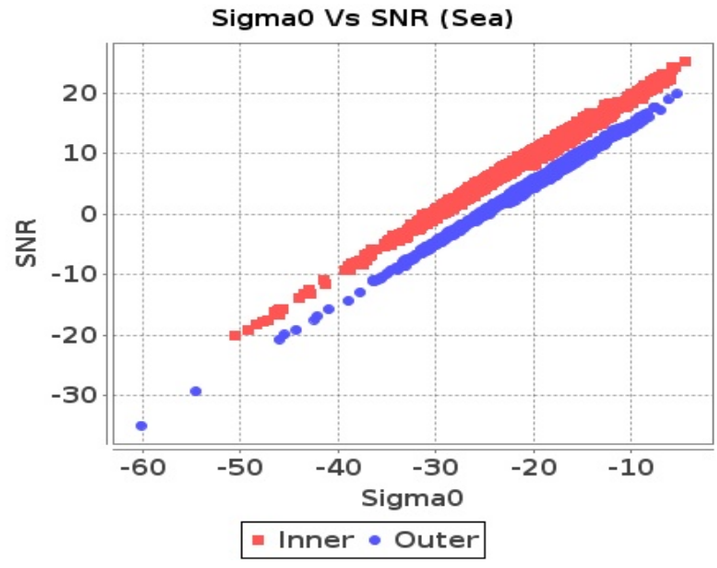
Normal
Deviations
Alarming
High Errors

Sigma0 Behaviour (Sigma0 Vs SNR)

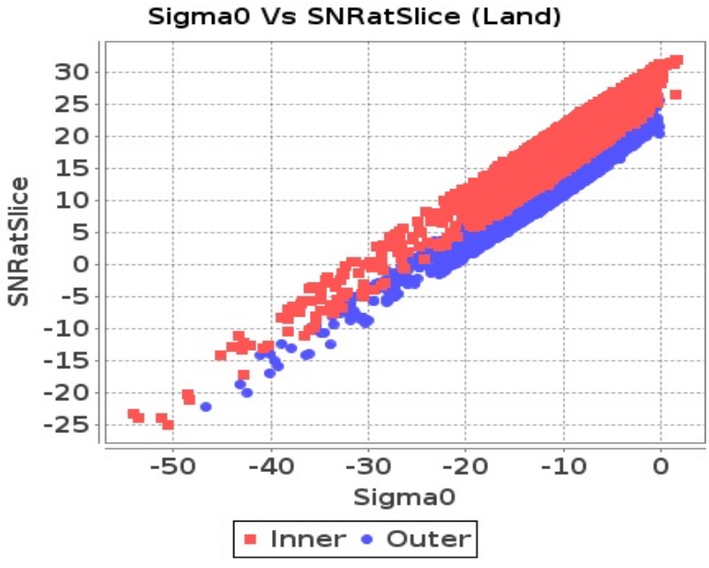
Footprint-Land



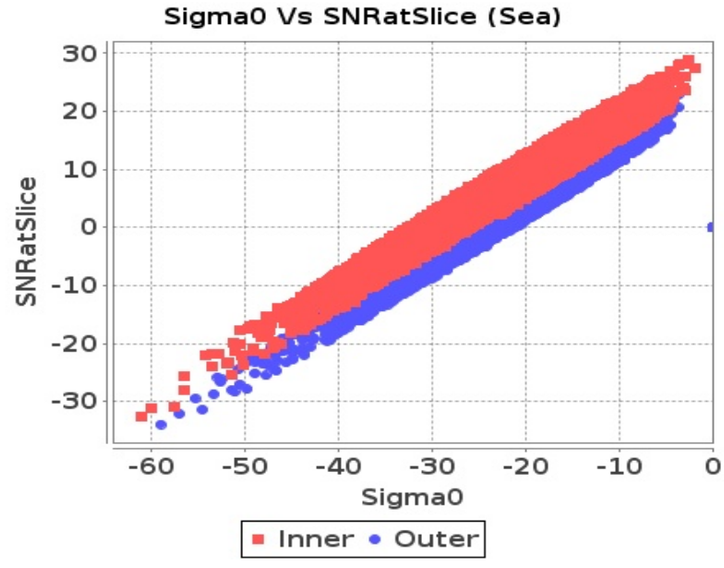
Footprint-Sea



Slice-Land

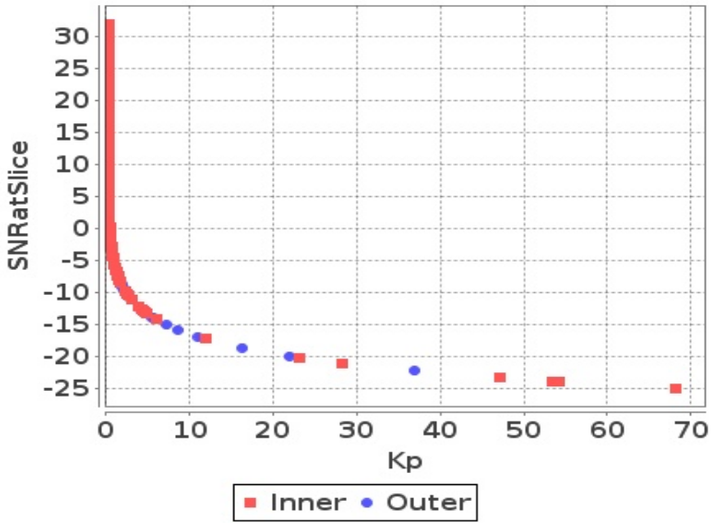


Slice-Sea

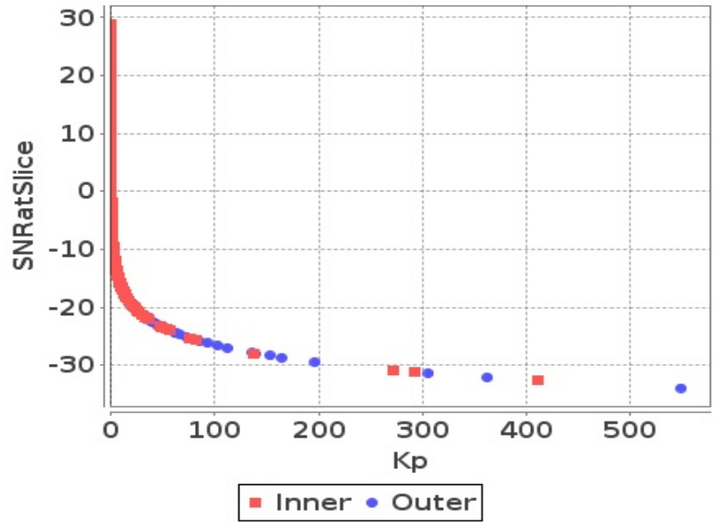


Sigma0 Behaviour (Kp Vs SNR)

Slice

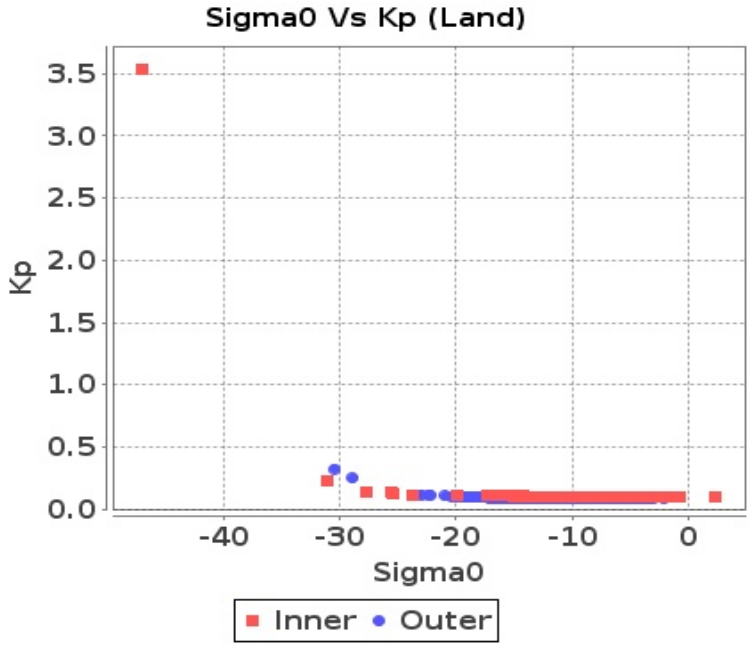


Slice

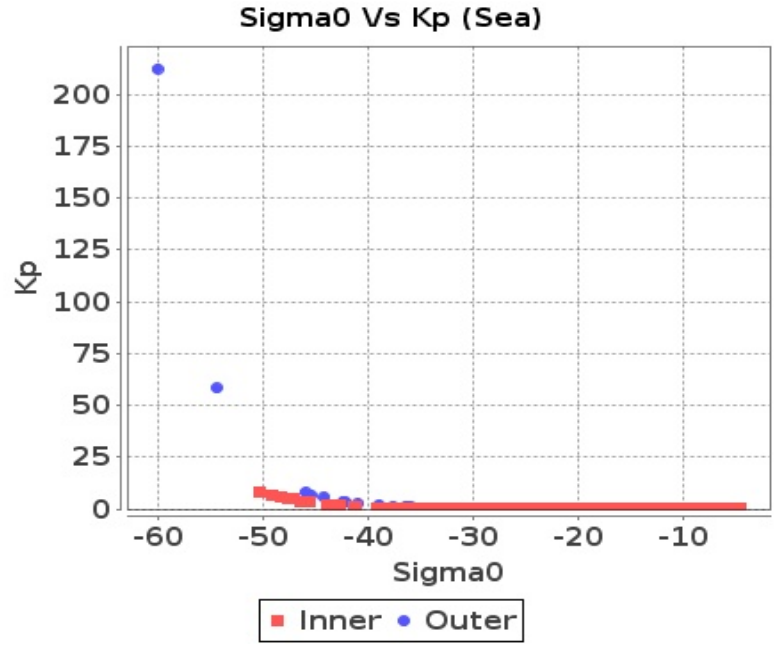


Sigma0 Behaviour(Sigma0 Vs Kp)

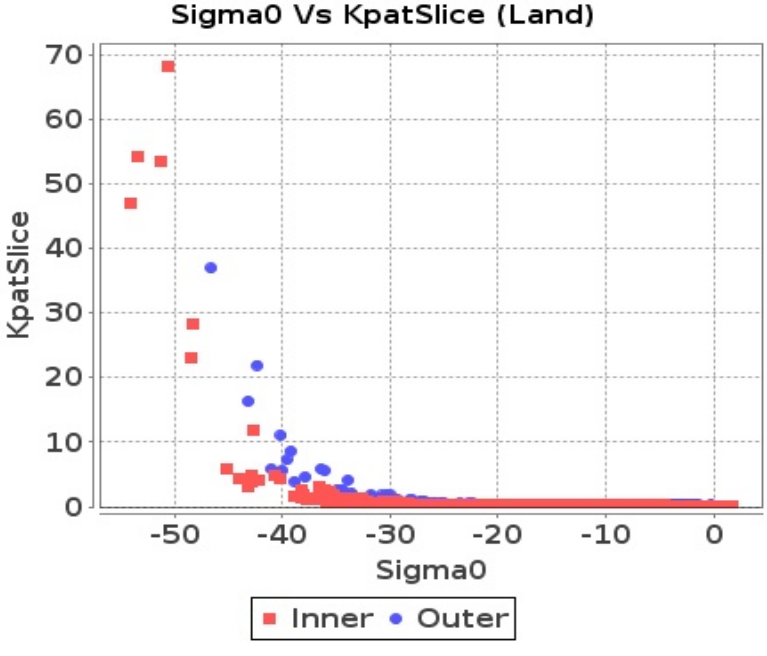
Footprint-Land



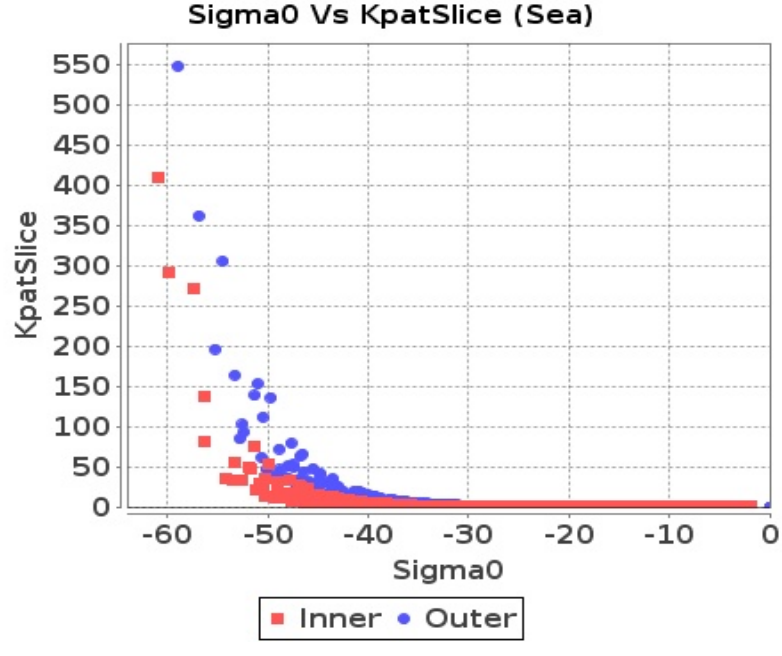
Footprint-Sea



Slice-Land



Slice-Sea

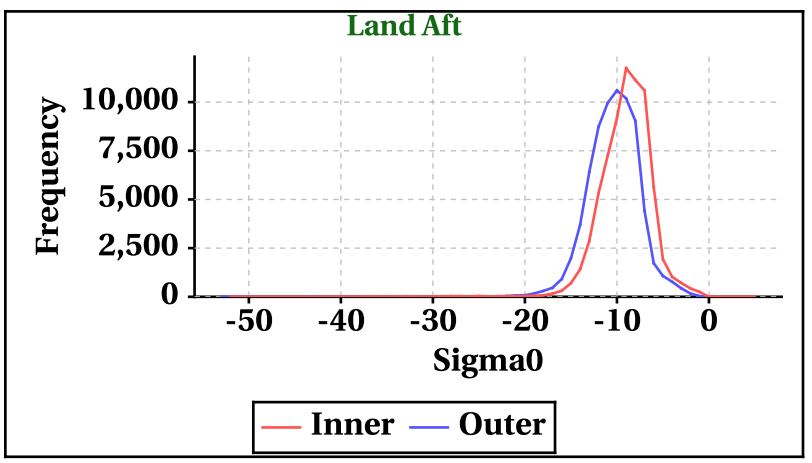


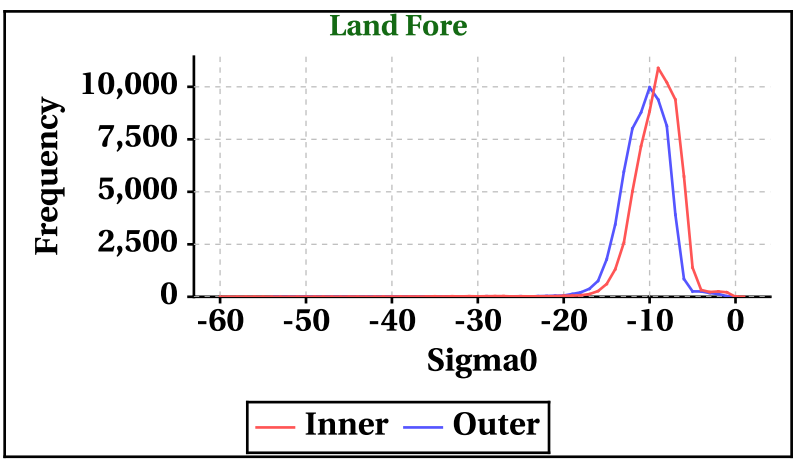
Dynamic Range (Data Histograms)

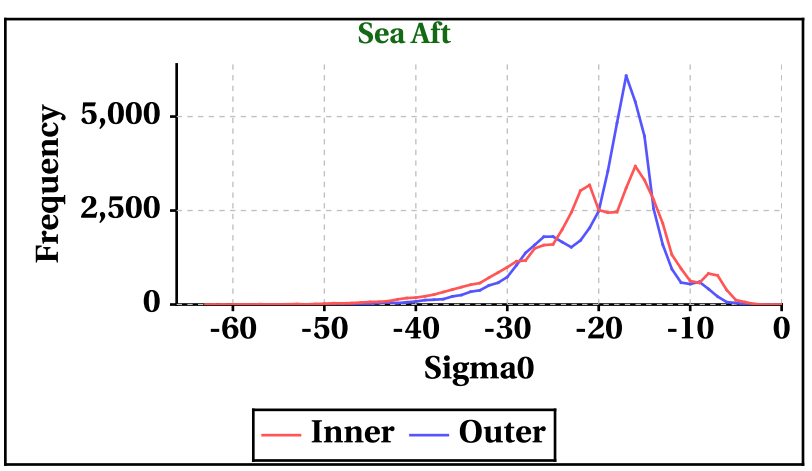
Sigma0(db)

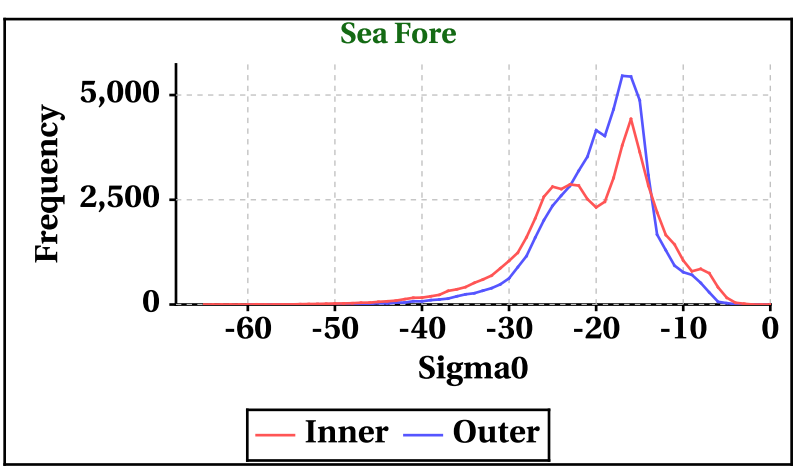
Inner Beam (HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-52	-60	-63	-65
Max	5	1	0	0

Outer Beam (VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-53	-54	-60	-60
Max	0	0	0	0





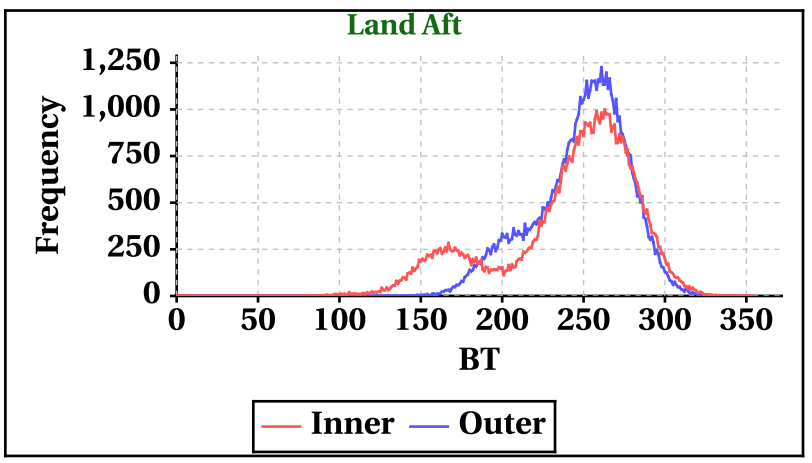


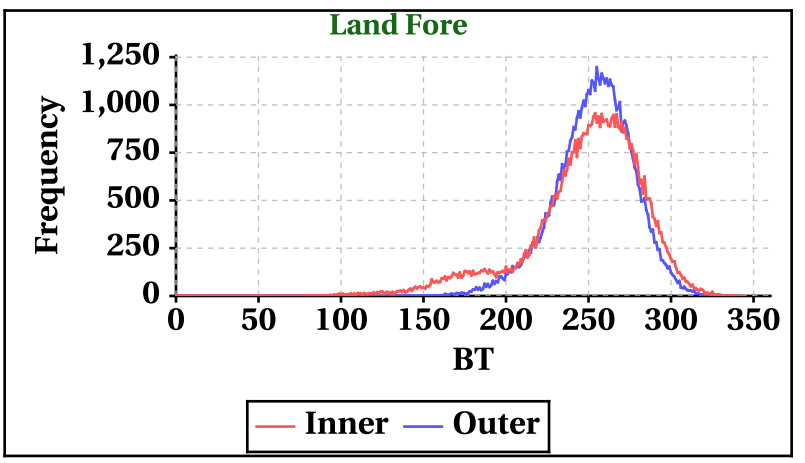


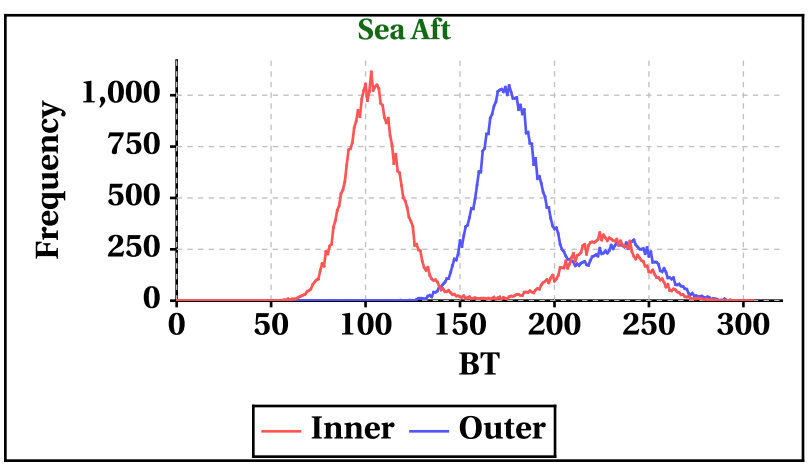
Brightness Temperature(K)

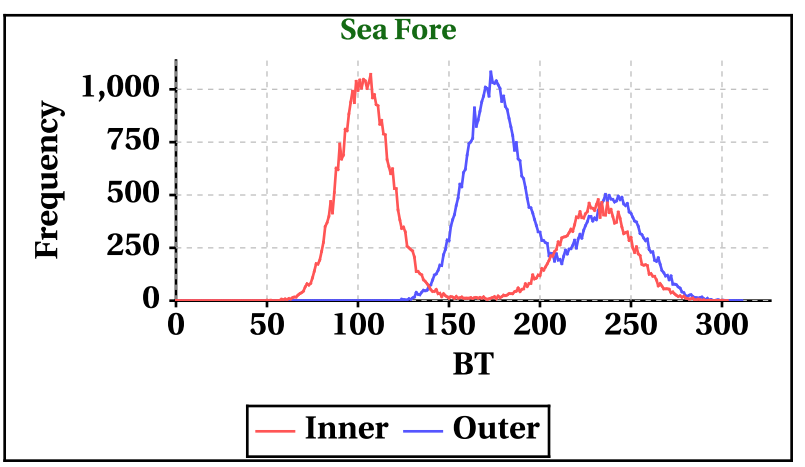
Inner Beam(HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	0	0
Max	354	343	305	303

Outer Beam(VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	0	0
Max	344	335	304	311







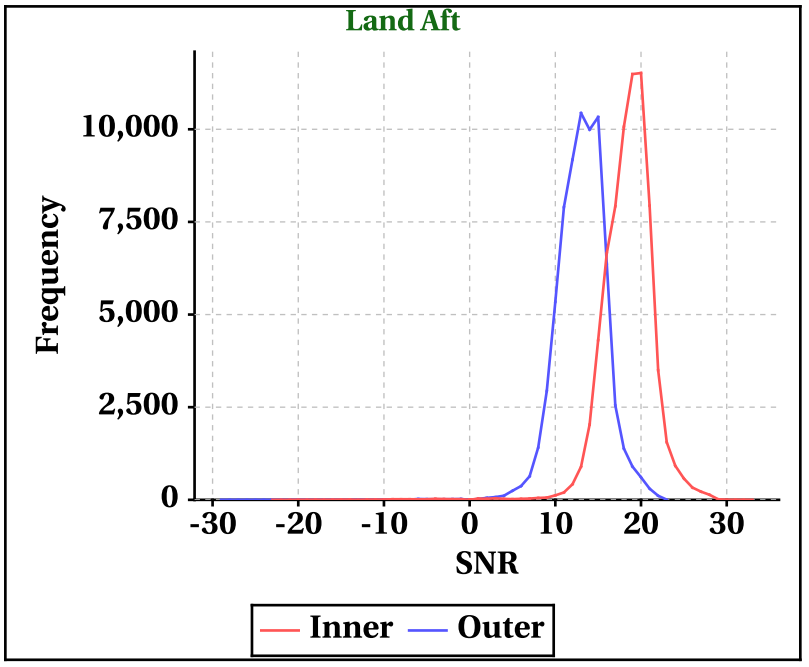


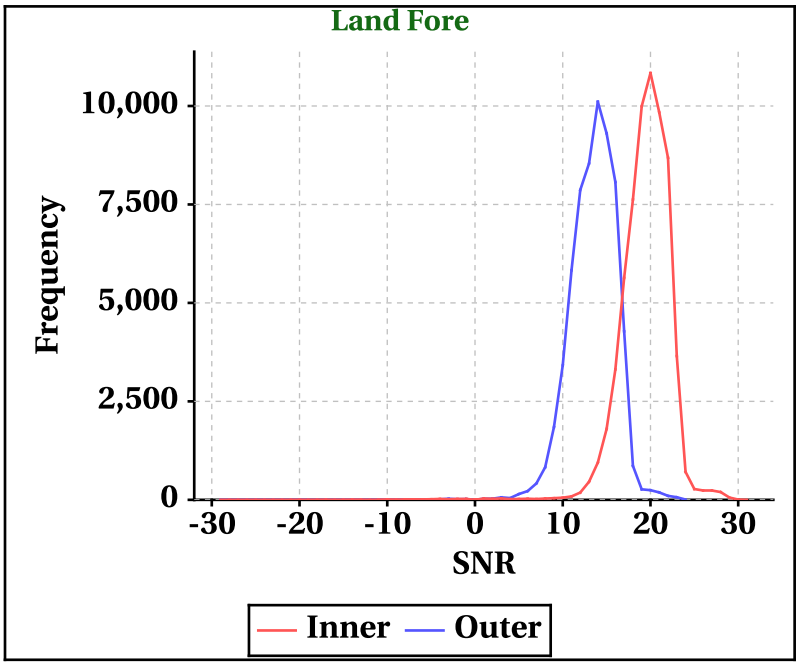
Dynamic Range (Data Histograms)

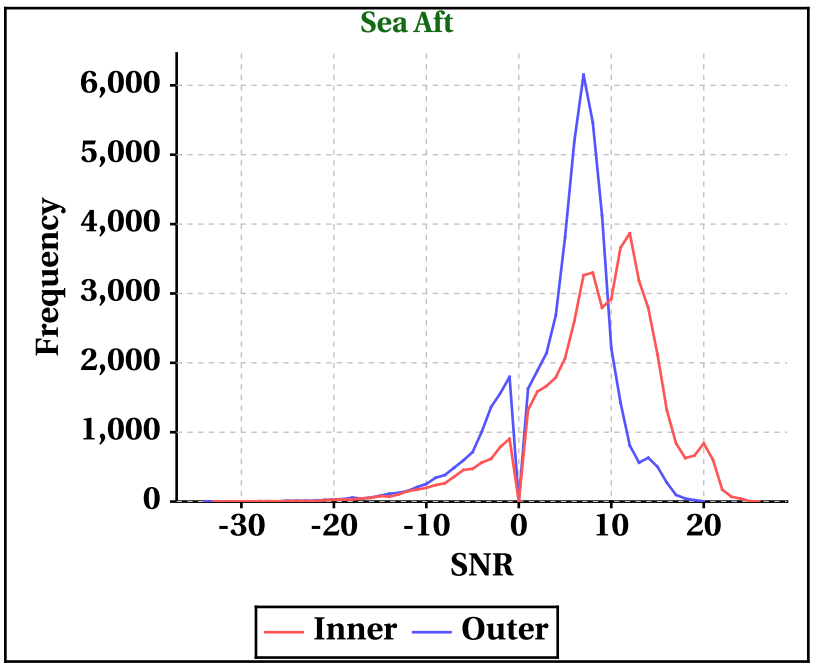
SNR(dBm)

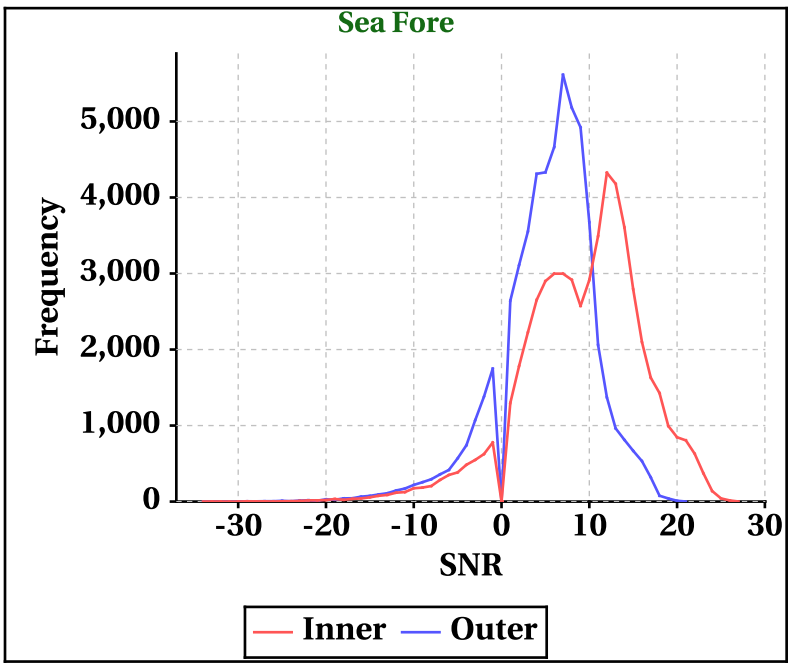
Inner Beam (HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-23	-29	-33	-34
Max	33	31	26	27

Outer Beam (VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-29	-29	-34	-34
Max	23	24	20	21



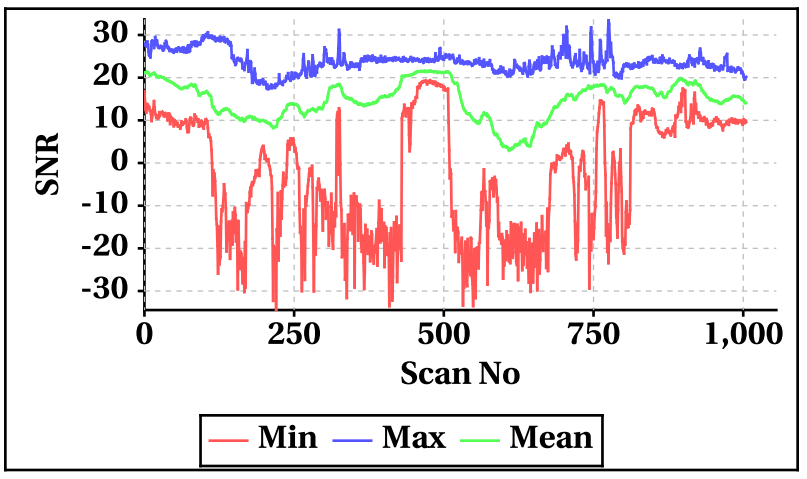




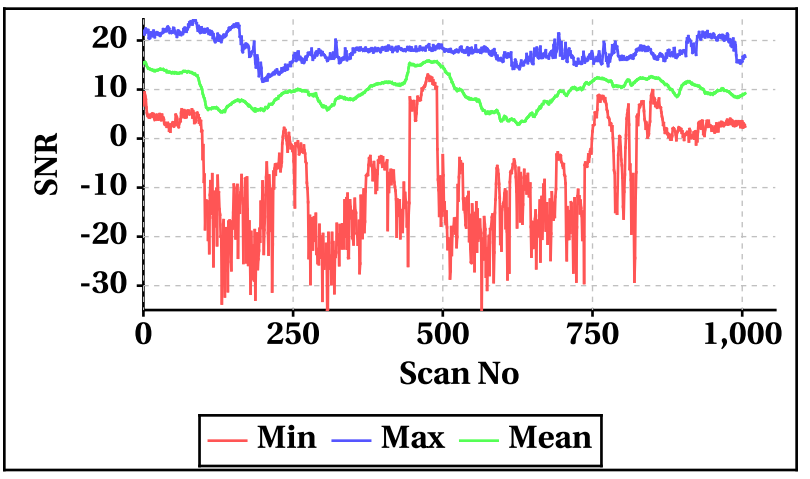


Orbit-wise behaviour of SNR

Inner Beam (HH)

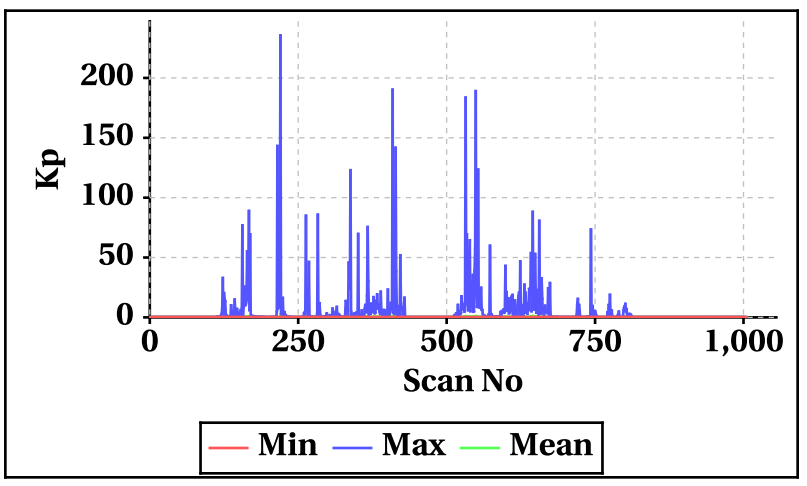


Outer Beam(VV)

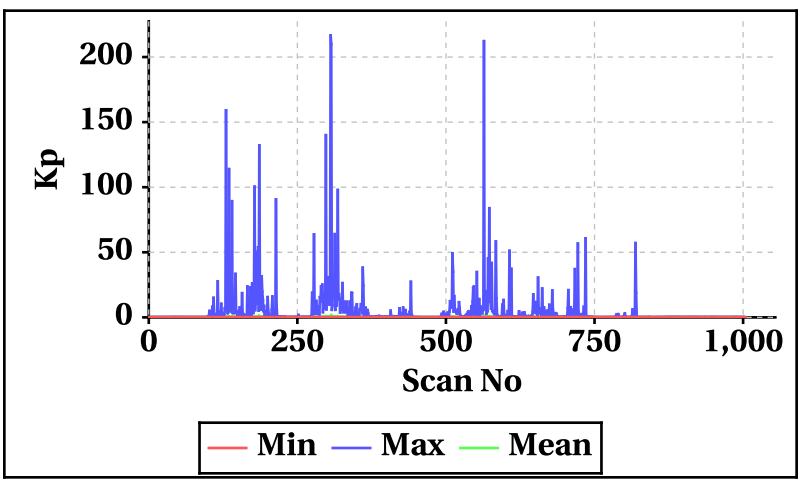


Orbit-wise behaviour of Kp,Kpa,Kpb,Kpc

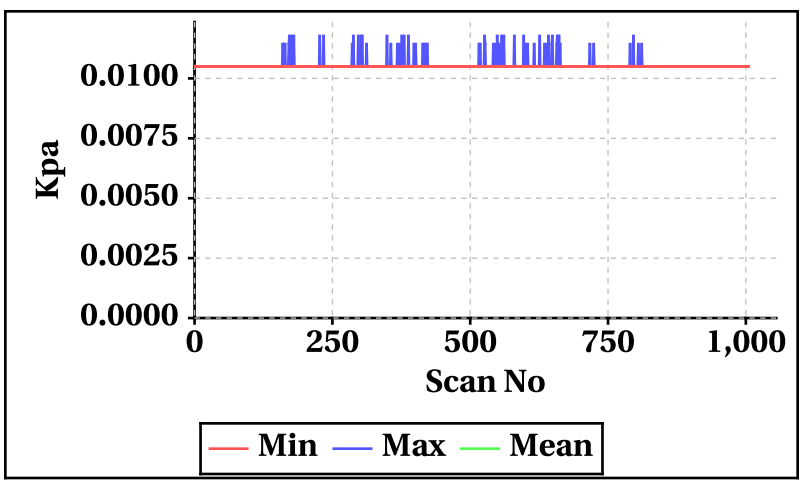
Inner Beam(HH)



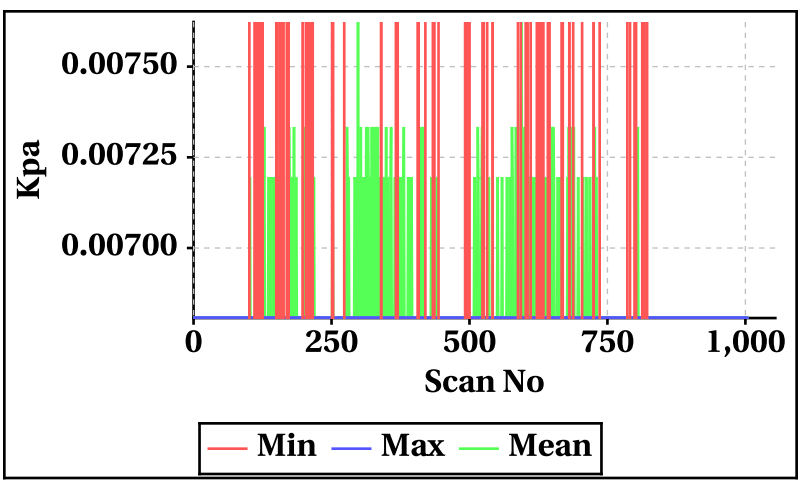
Outer Beam(VV)



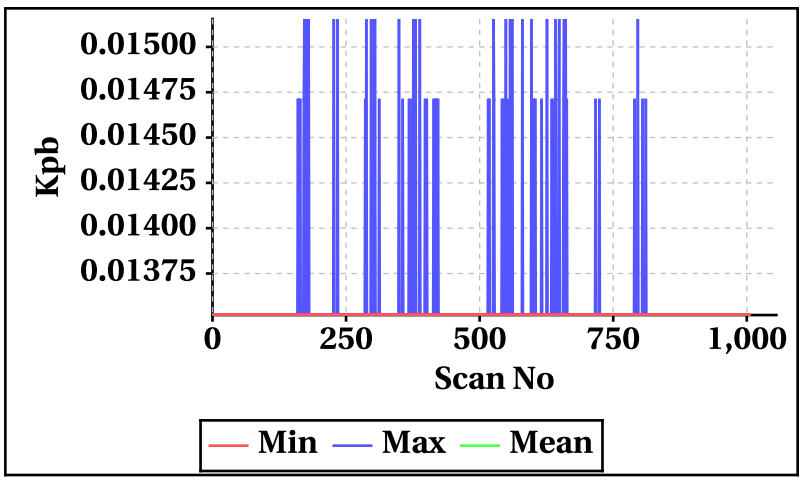
Inner Beam(HH)



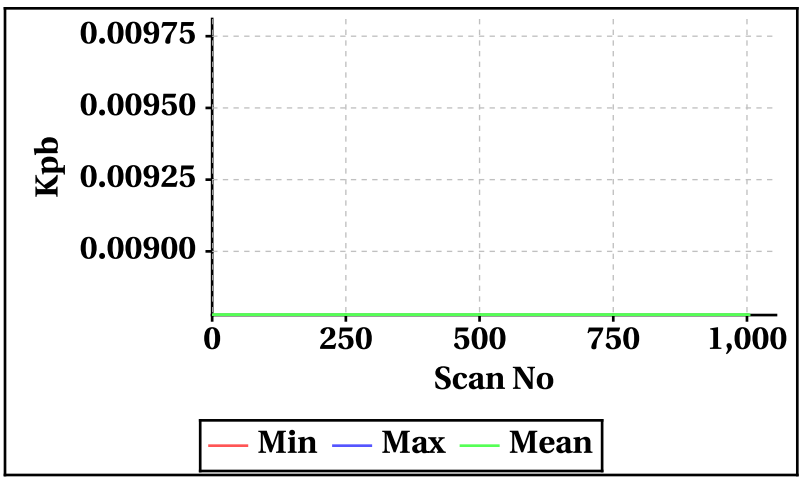
Outer Beam(VV)



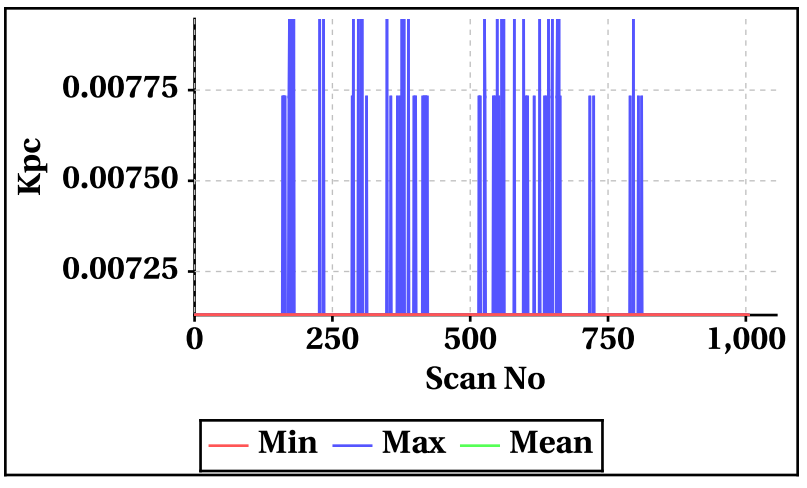
Inner Beam(HH)



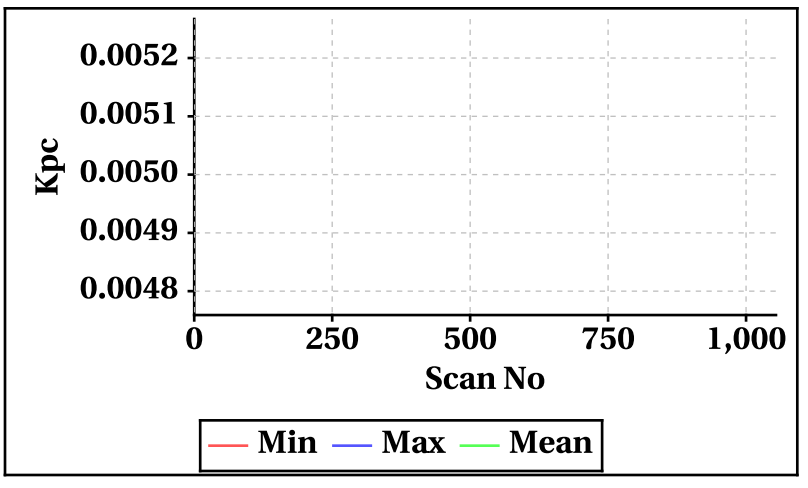
Outer Beam(VV)



Inner Beam(HH)

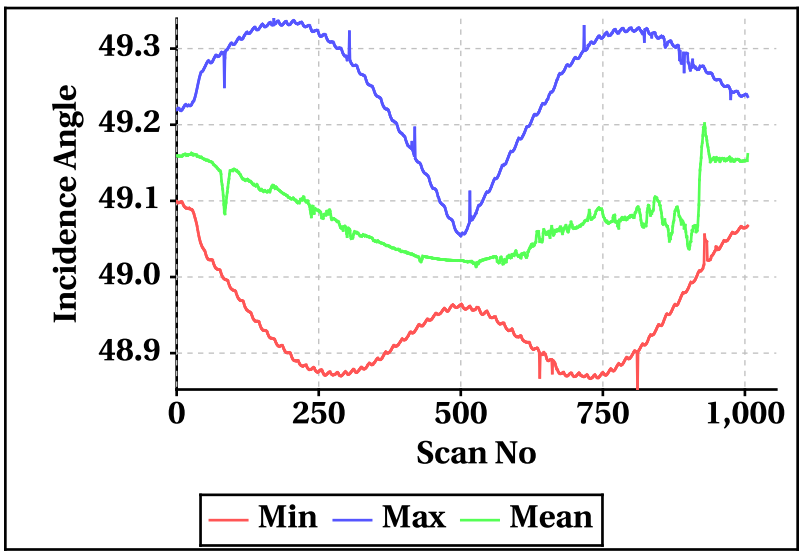


Outer Beam(VV)

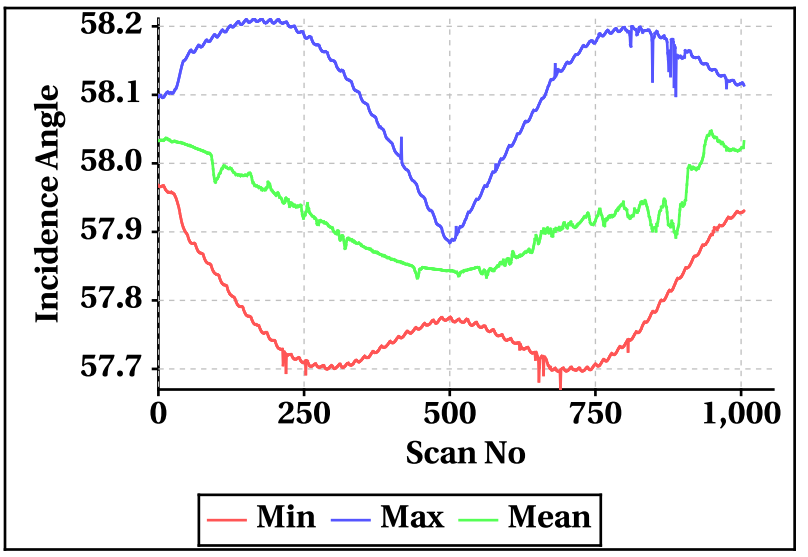


Orbt-wise behaviour of Incidence,Azimuth,Range,X-Factor

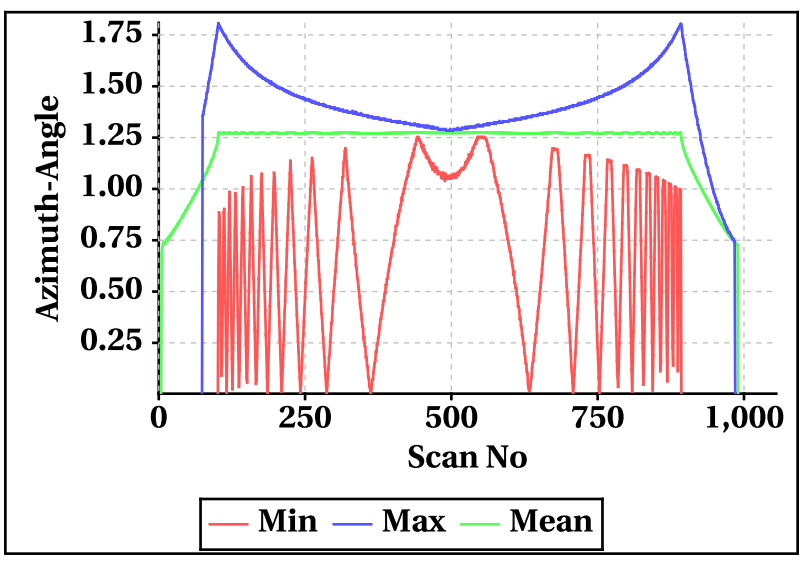
Inner Beam (HH)



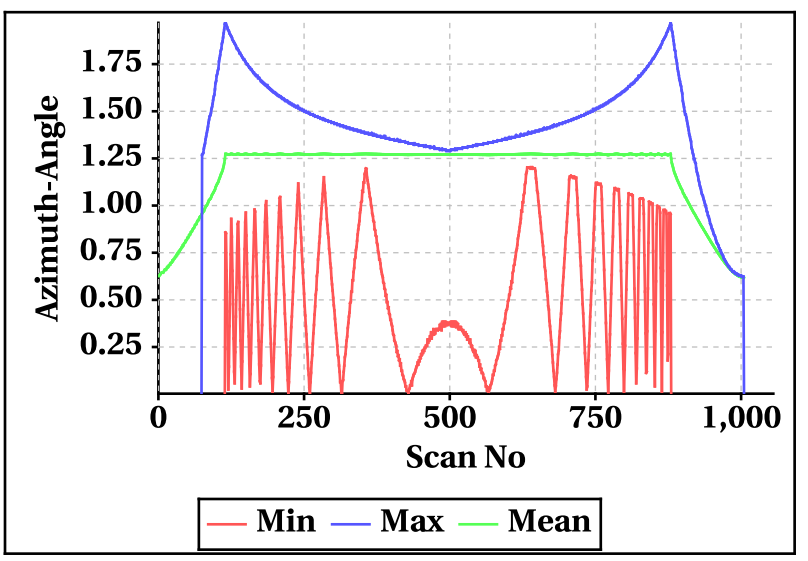
Outer Beam(VV)



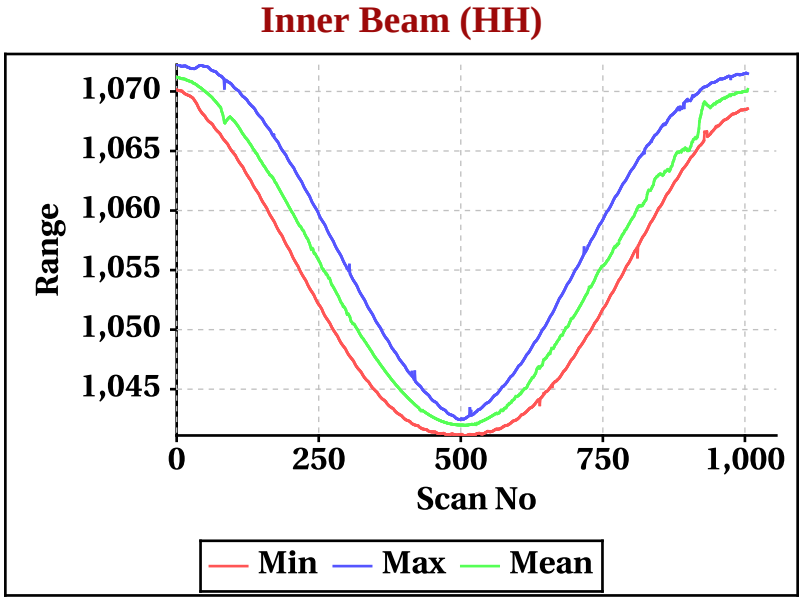
Inner Beam (HH)



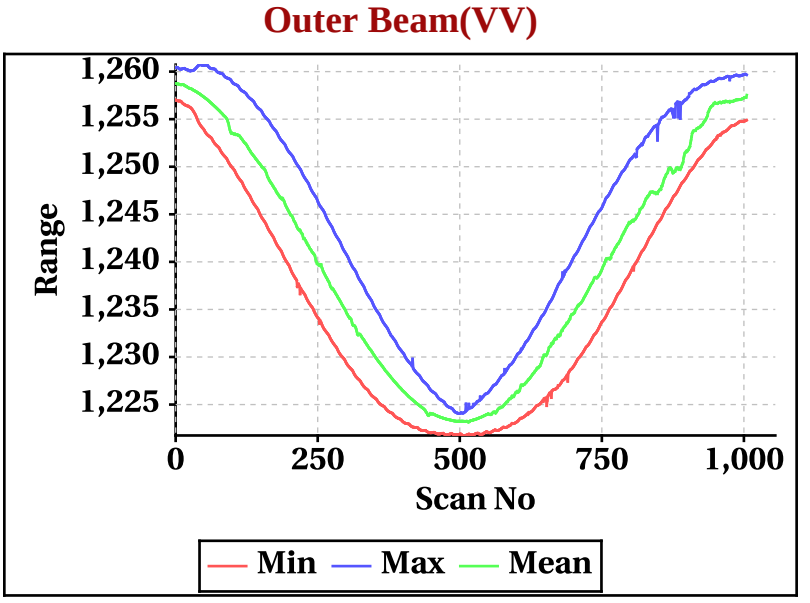
Outer Beam(VV)



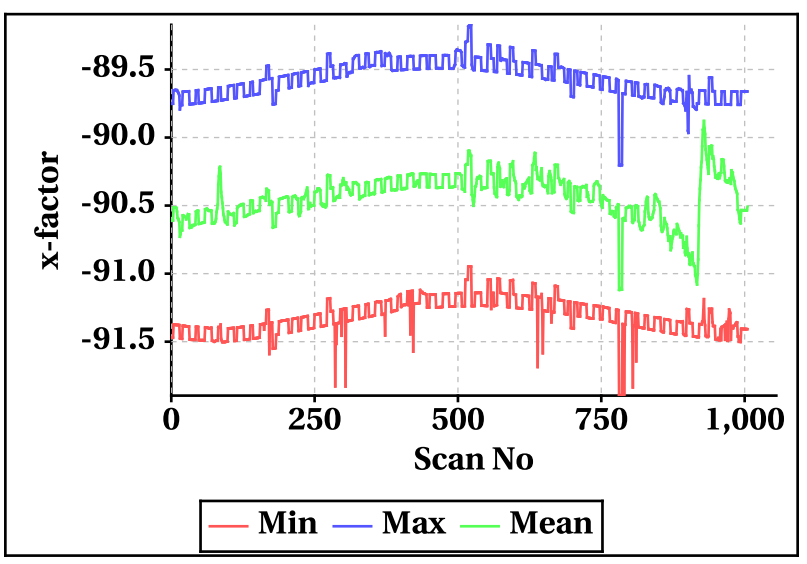
Inner Beam (HH)



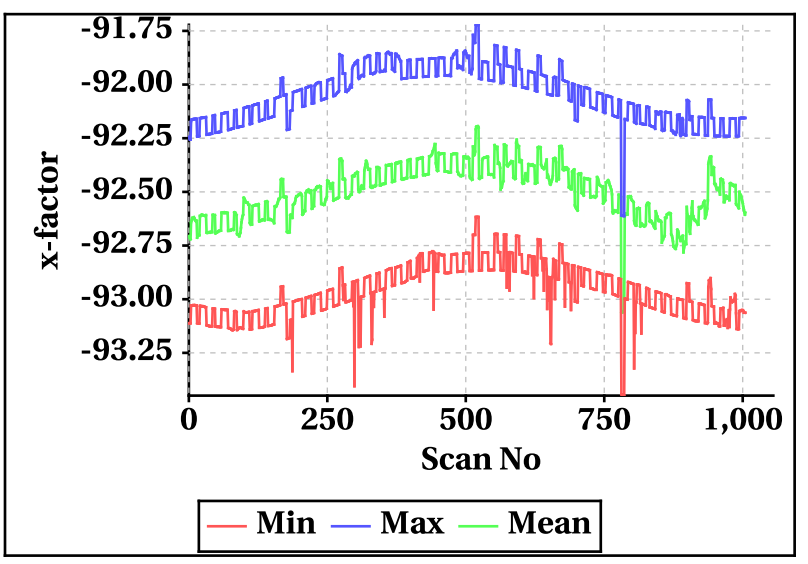
Outer Beam(VV)



Inner Beam (HH)



Outer Beam(VV)



Doppler Frequency Variation

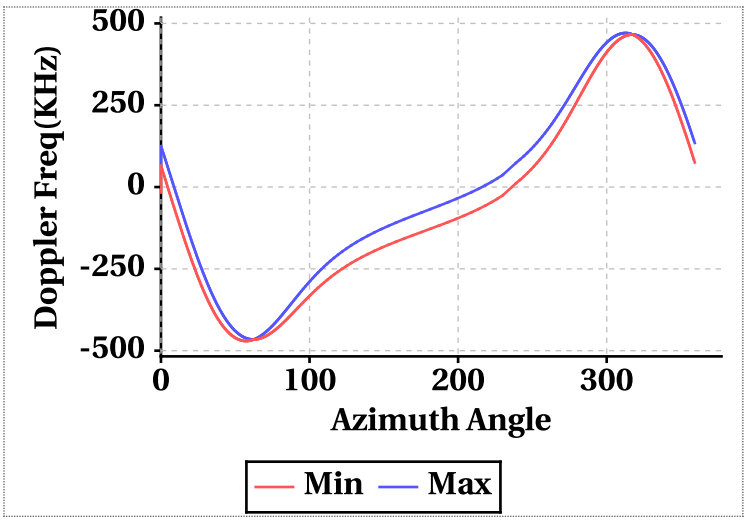
Doppler Frequency(KHz) variation statistics Over the half Orbit

	Inner Beam (HH)	Outer Beam (VV)
Min	-470.42	-527.20
Max	470.54	527.34

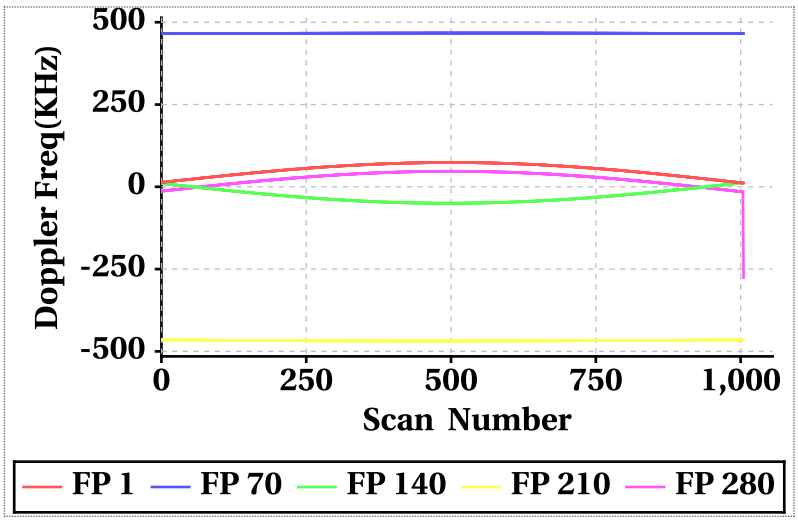
Doppler Frequency(KHz) variation

	Inner Beam (HH)			Outer Beam (VV)		
Doppler_FP	Min	Max	Mean	Min	Max	Mean
Doppler_1	11.38	73.80	51.46	7.62	77.52	52.54
Doppler_70	465.72	467.18	466.55	521.88	524.12	523.21
Doppler_140	-50.00	12.32	-27.69	-62.56	7.32	-37.53
Doppler_210	-468.44	-465.42	-467.31	-524.36	-521.80	-523.38
Doppler_280	-275.80	47.18	24.53	-313.18	59.36	33.97

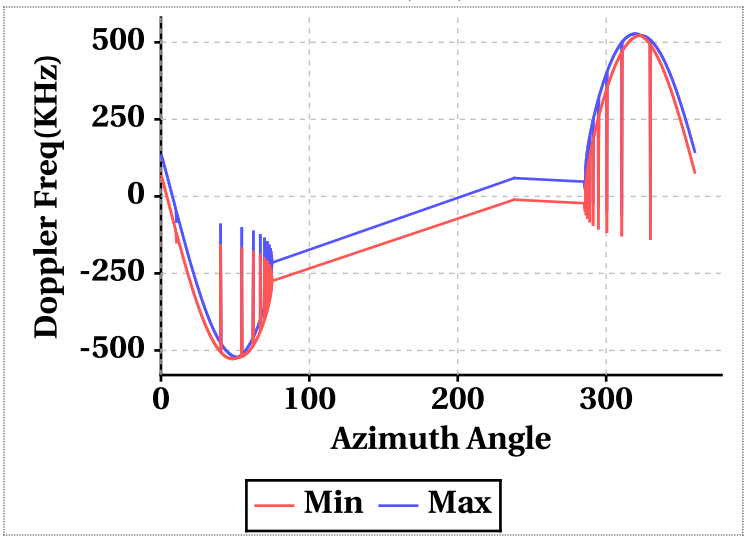
Footprint wise Doopler frequency variation Inner Beam (HH)



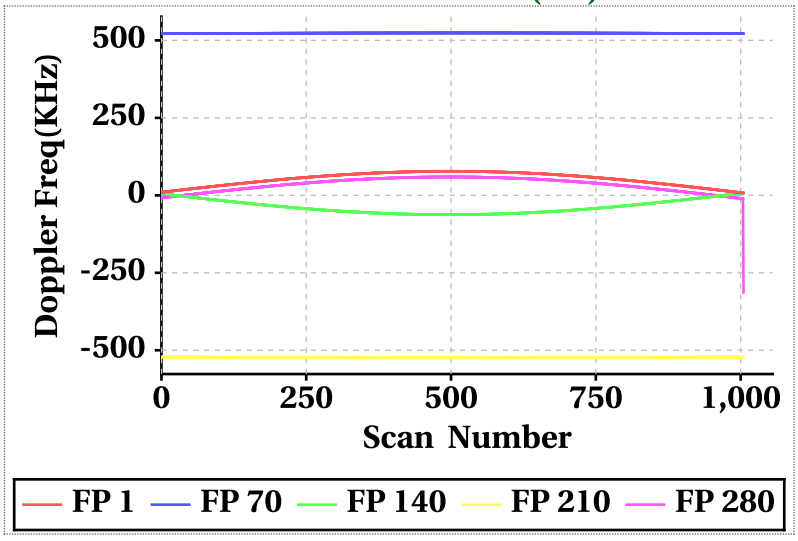
Doppler frequency variation at footprints: 1, 70, 140, 210 & 280 Inner Beam (HH)



Footprint wise Doopler frequency variation Outer Beam (VV)

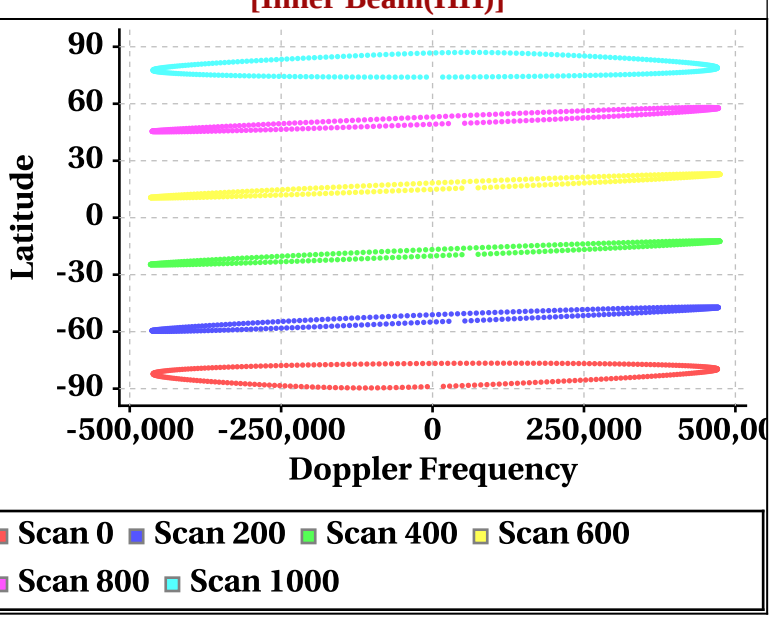


Doppler frequency variation at footprints: 1, 70, 140, 210 & 280 Outer Beam (VV)

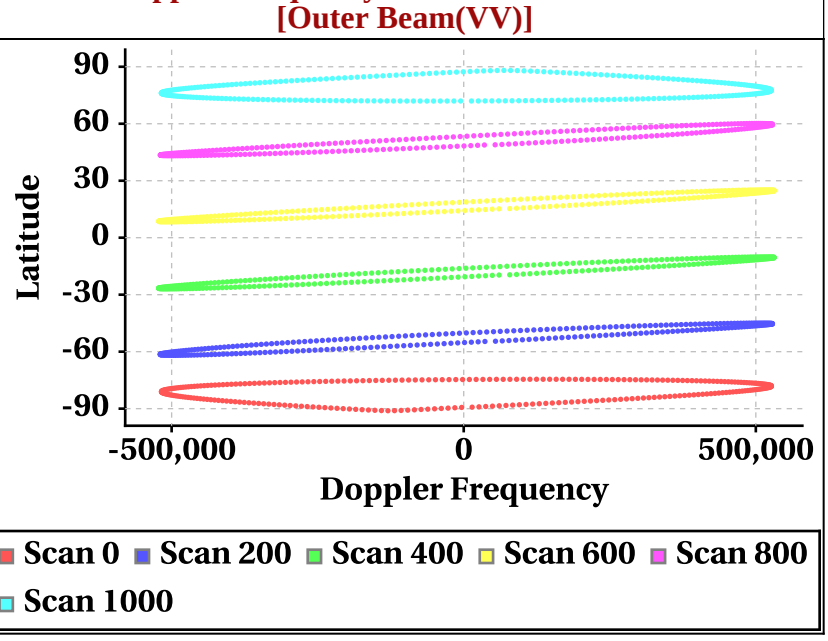


Latitude Vs Doppler Frequency

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



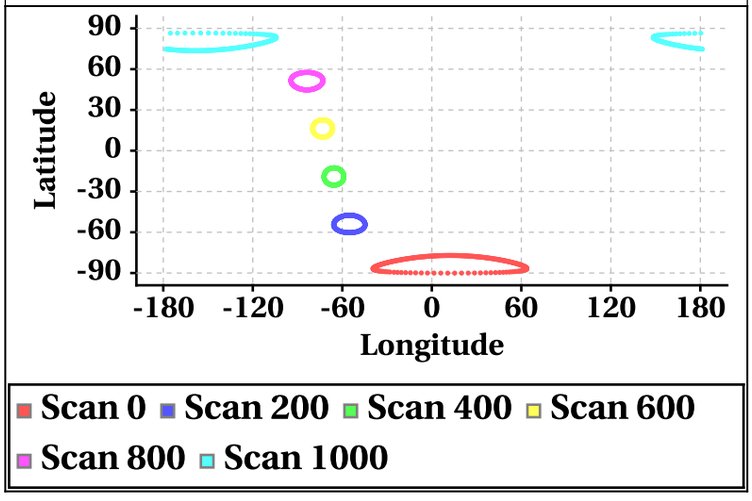
Doppler Frequency at Scan Interval of 200 [Outer Beam(VV)]



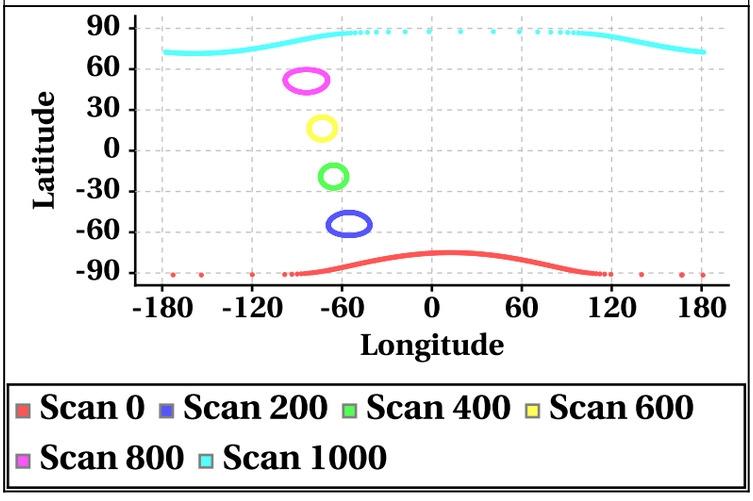
Parameter as a function of Latitude

Latitude Vs Longitude

Scan Trace [Inner Beam(HH)]

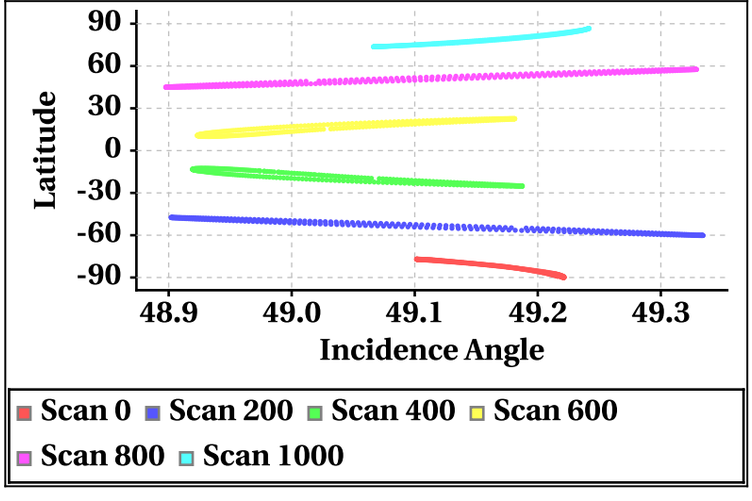


Scan Trace [Outer Beam (VV)]

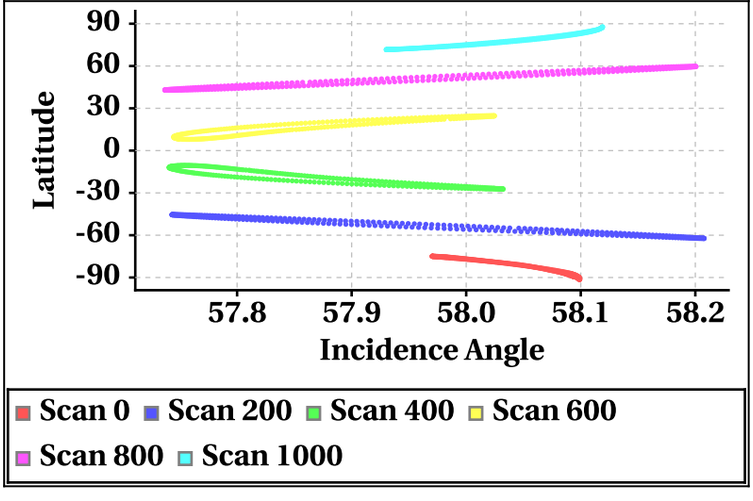


Latitude Vs Incidence Angle

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

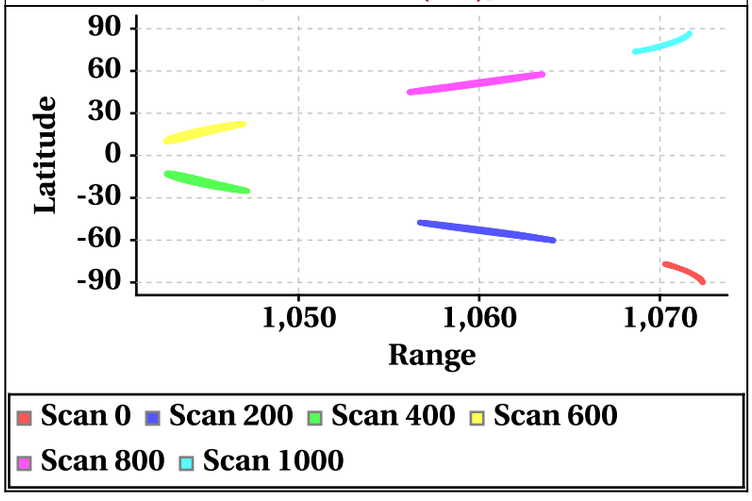


Incidence Angle at Scan Interval of 200 [Outer Beam (VV)]

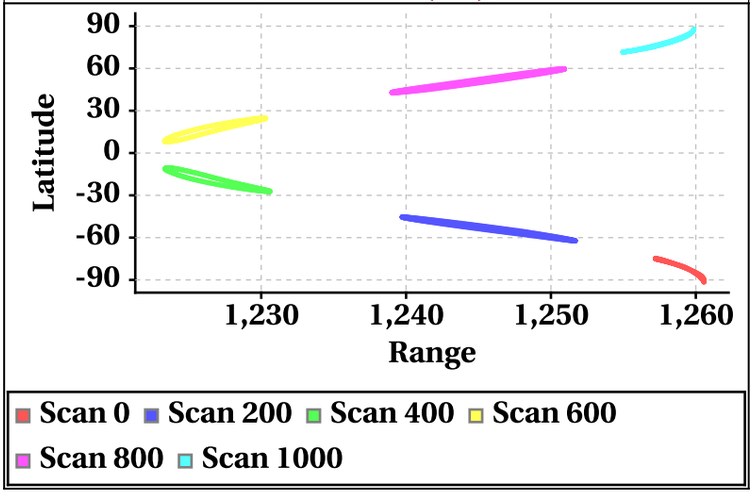


Latitude Vs Range

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



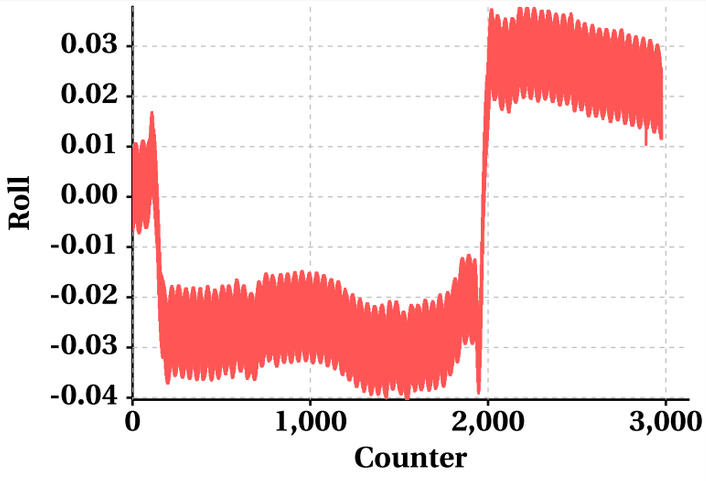
Range at Scan Interval of 200 [Outer Beam(VV)]



Variation in Orbit and Attitude Parameters

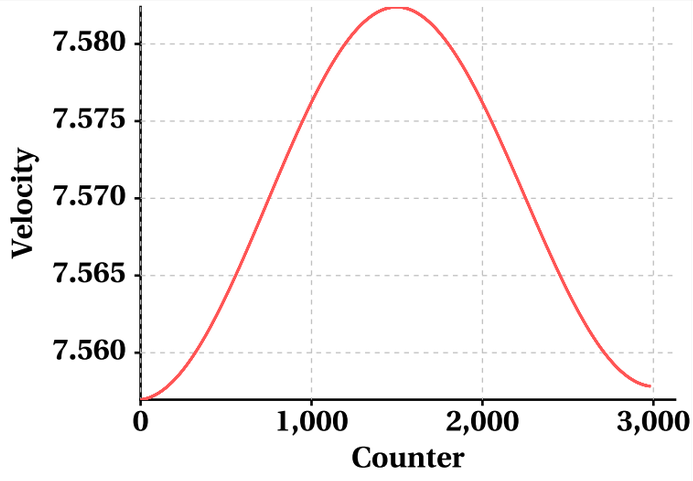
Roll

Min Roll(deg)	-0.040397
Max Roll(deg)	0.037814



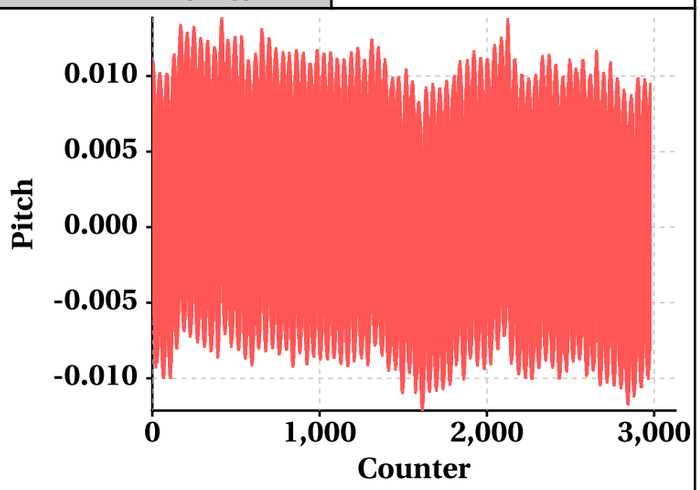
Velocity

Min Velocity(km/s)	7.556958
Max Velocity(km/s)	7.582394



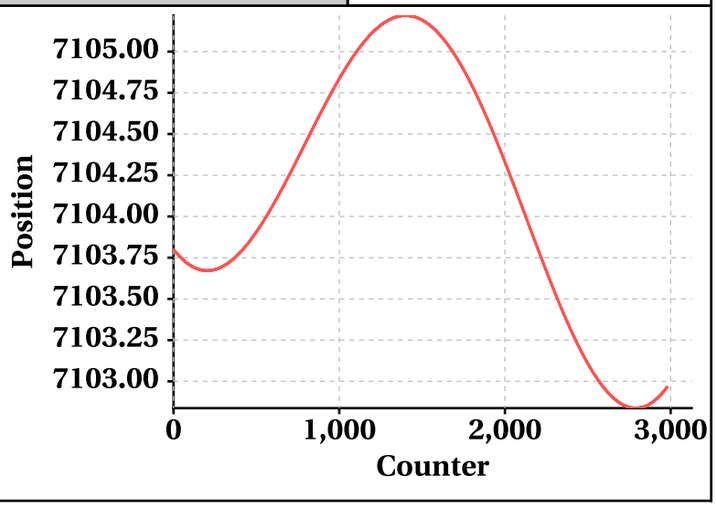
Pitch

Min Pitch(deg)	-0.012139
Max Pitch(deg)	0.01385



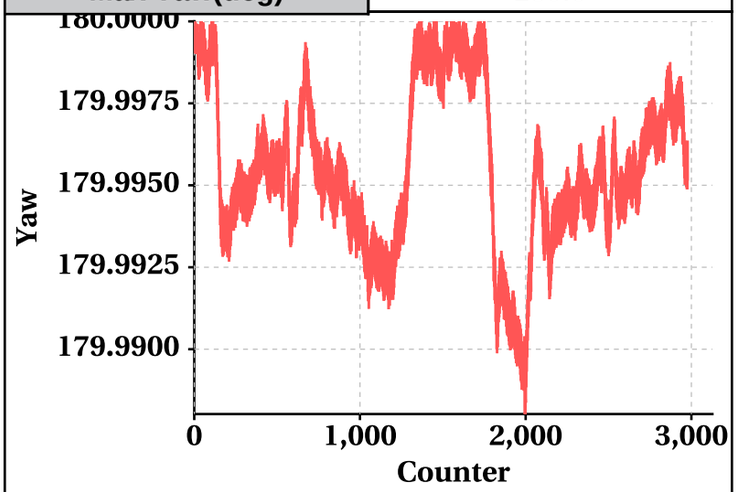
Position

Min Position(km)	7102.837402
Max Position(km)	7105.219238



Yaw

Min Yaw(deg)	179.988022
Max Yaw(deg)	180.0



TimeDifference

Min TimeDifference	1.0
Max TimeDifference	1.0

