

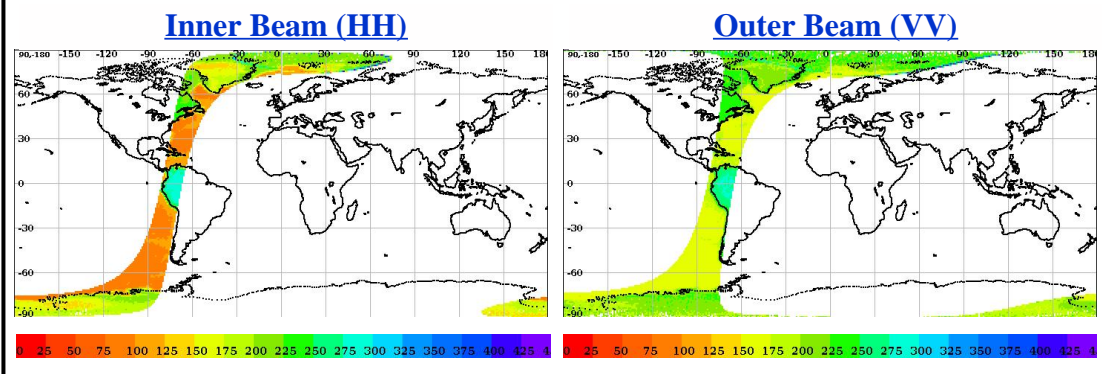
# SCATSAT-1 Scatterometer Level-1B Data Quality Evaluation Report

## Table of Contents

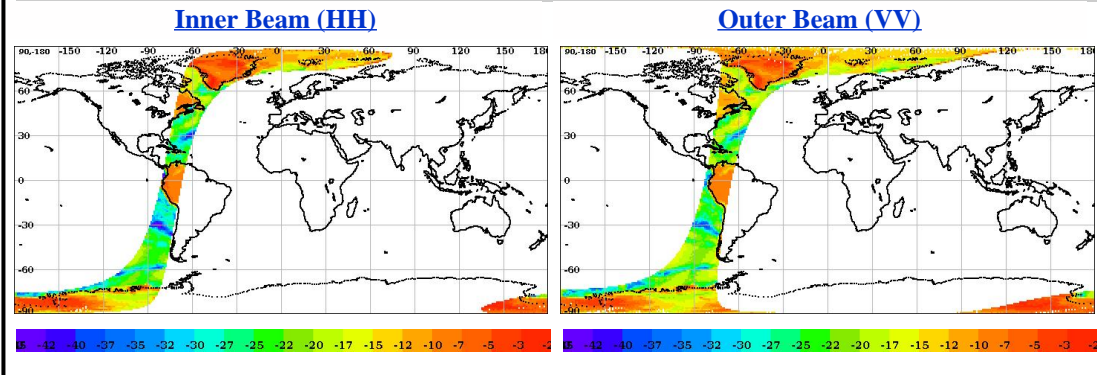
- Half-Orbit Coverage using BT & Sigma-0
- Invariant Site Sigma-0 Statistics (if Available)
- Half-Orbit Data Statistics
- Half Orbit wise - Dynamic Parameter (Sigma-0, Kp, SNR)Behaviour
- Dynamic Range (Data Histogram)
- Half Orbit Wise Behaviour - Static Parameters
- Doppler Variation (Across/Along Track for HH/VV Beam)
- L1B Parameter as a function of Latitude
- Half Orbit OAT Behaviour

Satellite Id	ScatSat-1	Start Orbit	2123	Total Scans	1017
Sensor Name	Scatterometer	End Orbit	2124	No of Inner FootPrints	281
Processor Version	1.1.1	Rev. Number	02123_02124	No Of Outer FootPrints	282
Half Orbit Direction	NS	Data Production Date	20-02-2017	No. Of Inner Slices	9
Equator Crossing Date	19-02-2017	Equator Crossing Time	13:57:32.000	No Of Outer Slices	15

## Brightness Temperature(k) Footprint trace



## Sigma0(dB) Footprint trace



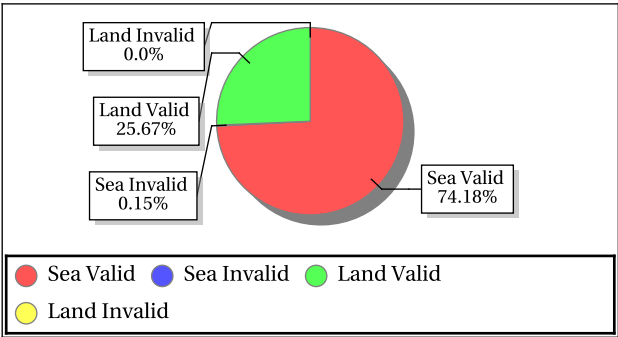
## Invalid and Poor Sigma-0 Quality Flag Statistics for Inner/Outer Slices\*

Sigma-0 Flags	Inner Beam	Outer Beam
Invalid Sigma0(%)	0.15	0.15
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(%)	0.01	0.01
Noise samples for blending Saturated	0.0	0.0
Count samp. for interpol. saturated (%)	0.00	0.00
Sigma0<lower bound (-96dB) (%)	0.0	0.0
Sigma0>upper bound (0 dB) (%)	0.00	0.00
SNR <-65 dB (%)	100.0	100.0

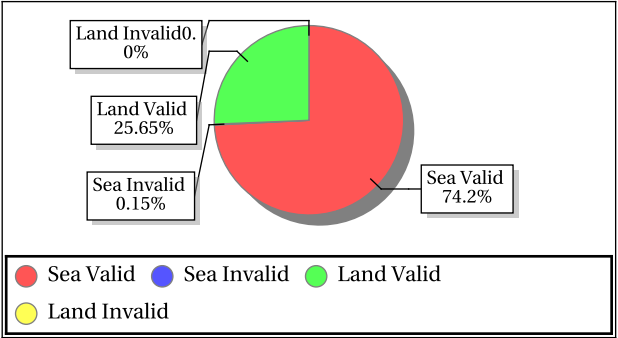
\*DP Format Document

## 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
GreenLand_2	77.50	-41.50	Inner	ASC	Aft	-5.51	-4.62	-5.03	0.31	121.89	154.97	143.53	13.15
GreenLand_2	77.50	-41.50	Inner	ASC	Fore	-4.66	-3.42	-4.19	0.48	132.87	191.71	158.93	18.00
GreenLand_3	71.55	-42.45	Inner	ASC	Aft	-11.56	-8.67	-9.91	0.79	158.93	208.13	182.01	13.93
GreenLand_3	71.55	-42.45	Inner	ASC	Fore	-11.13	-8.84	-10.03	0.69	155.11	205.96	179.71	14.52
GreenLand_1	74.69	-42.50	Inner	ASC	Aft	-9.78	-8.09	-8.94	0.50	141.49	181.67	161.21	11.77
GreenLand_1	74.69	-42.50	Inner	ASC	Fore	-9.24	-7.13	-8.24	0.69	146.91	191.20	169.16	12.63
Amazon_1	0.00	-67.00	Inner	ASC	Aft	-8.97	-6.29	-7.74	0.59	250.36	327.72	292.42	16.57
Amazon_1	0.00	-67.00	Inner	ASC	Fore	-8.91	-6.38	-7.53	0.56	244.08	328.74	285.67	16.85
GreenLand_2	77.50	-41.50	Outer	ASC	Aft	-5.16	-4.09	-4.67	0.44	176.46	199.74	190.97	10.33
GreenLand_2	77.50	-41.50	Outer	ASC	Fore	-4.63	-3.63	-4.31	0.40	185.47	219.74	203.91	12.47
GreenLand_3	71.55	-42.45	Outer	ASC	Aft	-11.68	-10.20	-10.96	0.60	187.40	256.73	219.28	17.71
GreenLand_3	71.55	-42.45	Outer	ASC	Fore	-11.29	-9.79	-10.63	0.44	198.94	241.82	211.78	11.06
GreenLand_1	74.69	-42.50	Outer	ASC	Aft	-9.97	-7.90	-8.90	0.65	195.10	254.08	211.92	17.86
GreenLand_1	74.69	-42.50	Outer	ASC	Fore	-8.82	-7.24	-8.00	0.46	207.95	237.37	223.48	9.15
Amazon_1	0.00	-67.00	Outer	ASC	Aft	-9.50	-7.39	-8.66	0.51	251.42	304.67	278.83	12.97
Amazon_1	0.00	-67.00	Outer	ASC	Fore	-9.64	-7.08	-8.24	0.48	244.91	325.76	277.51	18.70



## 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. (%)
<b>Kp</b>	0.10	262.43	0.28	2.362	0.10	229.54	0.27	2.252	0.10	0.12	0.10	0.000	0.10	0.12	0.10	0.000
<b>Kpa</b>	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
<b>Kpb</b>	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
<b>Kpc</b>	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
<b>SNR</b>	-34.92	25.90	5.17	0.510	-34.34	26.59	5.23	0.632	6.32	29.04	19.76	21.427	6.45	29.94	20.72	36.374

	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. (%)
<b>Kp</b>	0.08	188.56	0.26	2.319	0.08	209.24	0.26	2.397	0.08	0.13	0.08	0.000	0.08	0.12	0.08	0.000
<b>Kpa</b>	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
<b>Kpb</b>	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
<b>Kpc</b>	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
<b>SNR</b>	-34.50	19.33	3.04	0.000	-34.96	19.85	2.78	0.000	0.37	23.35	14.13	0.309	2.04	23.62	14.76	1.029

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)

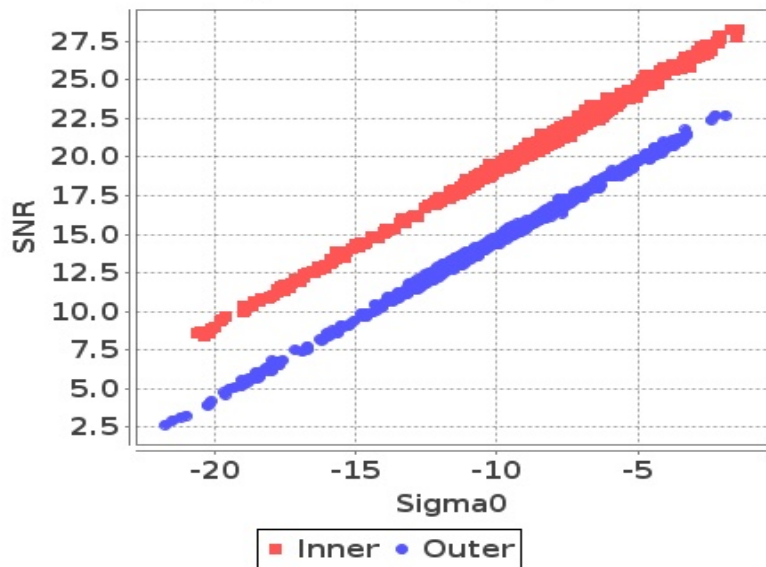
	Inner Beam (VV)				Outer Beam (VV)				Parameter Specifications		
	Min	Max	Mean	Bad Occ. (%)	Min	Max	Mean	Bad Occ. (%)	Parameter	Min	Max
<b>Incidence Angle (deg)</b>	48.68	49.39	48.98	0.000	57.53	58.31	57.90	0.000	Inci.(Inner)	47.10	49.90
<b>Azimuth Diff. (deg)</b>	0.0026	6.20	1.08	0.204	0.0027	25.13	1.08	0.208	Inci.(Outer)	57.30	58.90
<b>Range(Km)</b>	1027.66	1089.86	1050.74	0.000	1205.48	1283.11	1235.17	12.726	Azimuth Diff.	0.60	2.00
<b>X Factor(dbm)</b>	-91.35	-89.99	-90.13	0.000	-93.15	-92.00	-92.12	0.000	Range(Inner)	1025.00	1095.70
<b>Across Distance (Km)</b>	16.04	16.61	16.17	0.000	21.33	22.22	21.36	1.000	Range(Outer)	1210.00	1280.00
<b>Along Distance (Km)</b>	19.04	8522.69	36.47	2.000	18.79	8312.22	35.96	2.000	X-Factor	-100.00	-80.00
									Ac.Distance(Inner)	15.00	20.00
									Ac.Distance(Outer)	15.00	22.00
									Al.Distance(Inner)	15.00	30.00
									Al.Distance(Outer)	10.00	30.00
									<ul style="list-style-type: none"> <li><span style="display: inline-block; width: 15px; height: 15px; background-color: green; border: 1px solid black;"></span> Normal</li> <li><span style="display: inline-block; width: 15px; height: 15px; background-color: yellow; border: 1px solid black;"></span> Deviations</li> <li><span style="display: inline-block; width: 15px; height: 15px; background-color: orange; border: 1px solid black;"></span> Alarming</li> <li><span style="display: inline-block; width: 15px; height: 15px; background-color: red; border: 1px solid black;"></span> High Errors</li> </ul>		



# Sigma0 Behaviour (Sigma0 Vs SNR)

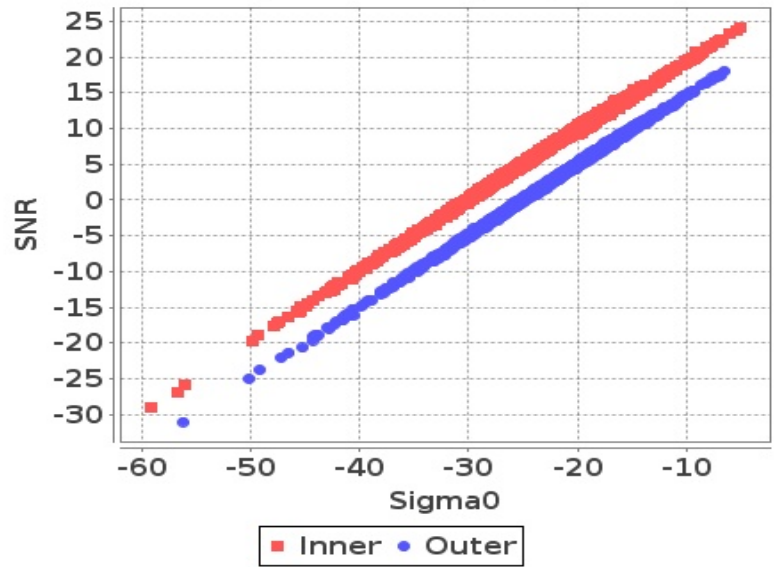
Footprint-Land

Sigma0 Vs SNR (Land)



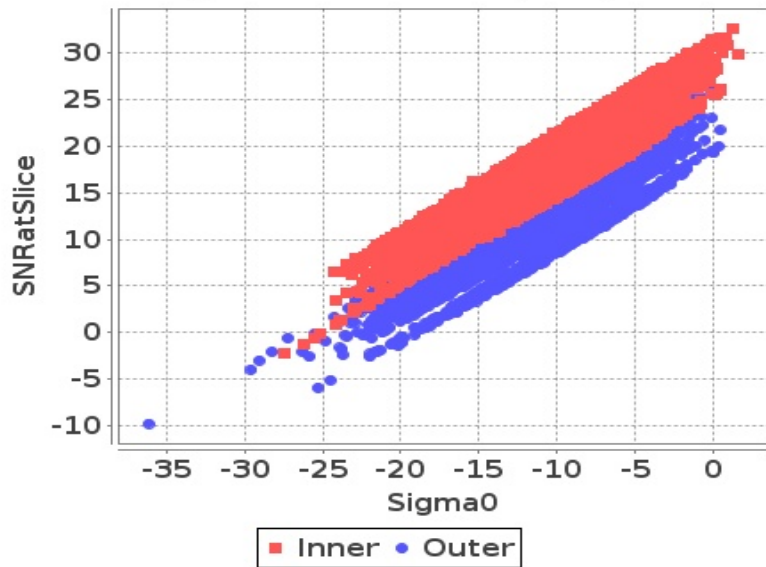
Footprint-Sea

Sigma0 Vs SNR (Sea)



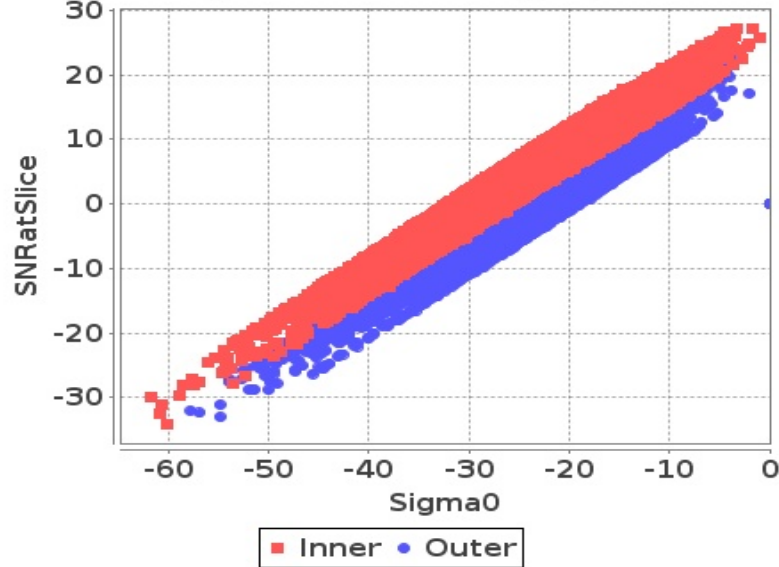
Slice-Land

Sigma0 Vs SNRatSlice (Land)



Slice-Sea

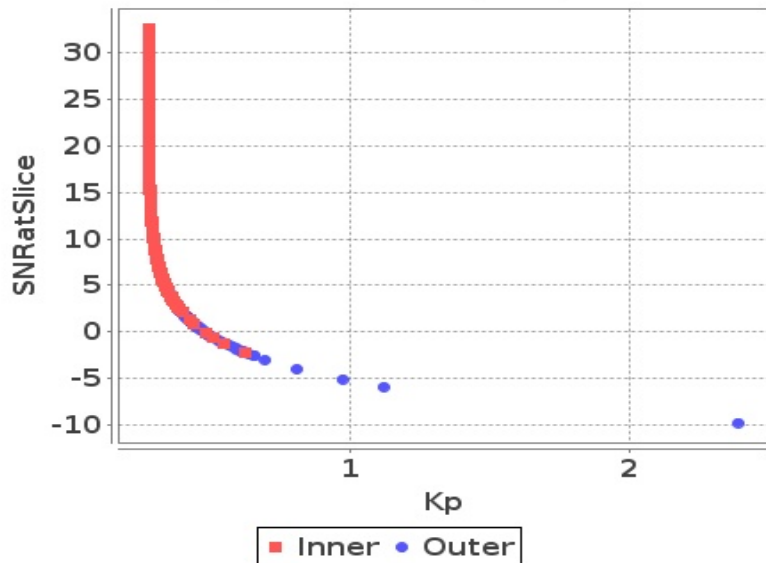
Sigma0 Vs SNRatSlice (Sea)



# Sigma0 Behaviour (Kp Vs SNR)

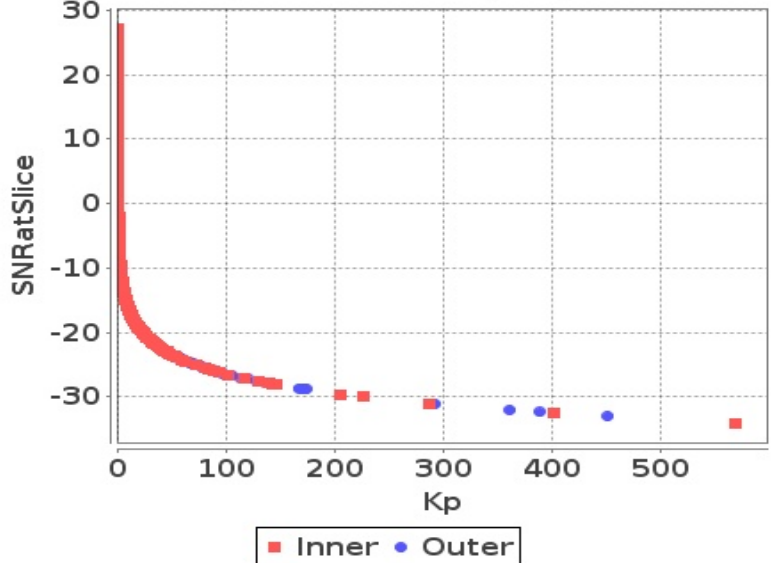
Slice

Kp Vs SNRatSlice (Land)



Slice

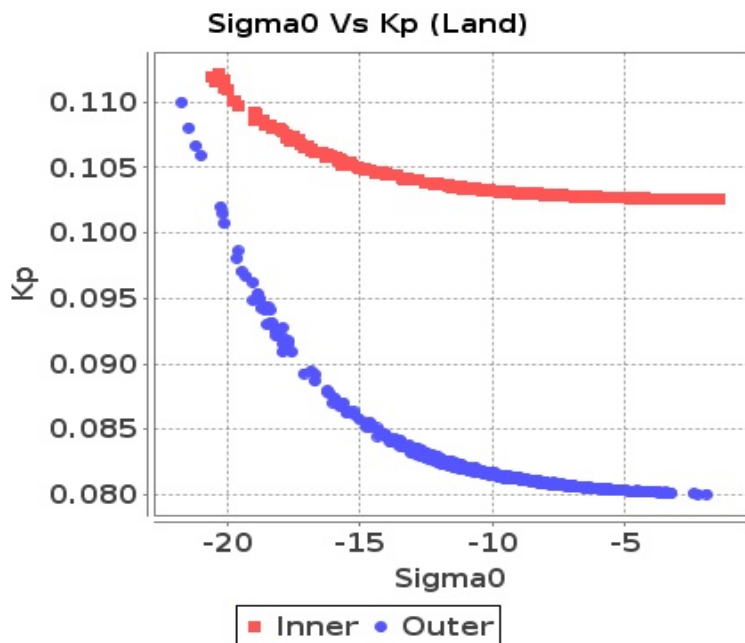
Kp Vs SNRatSlice (Sea)



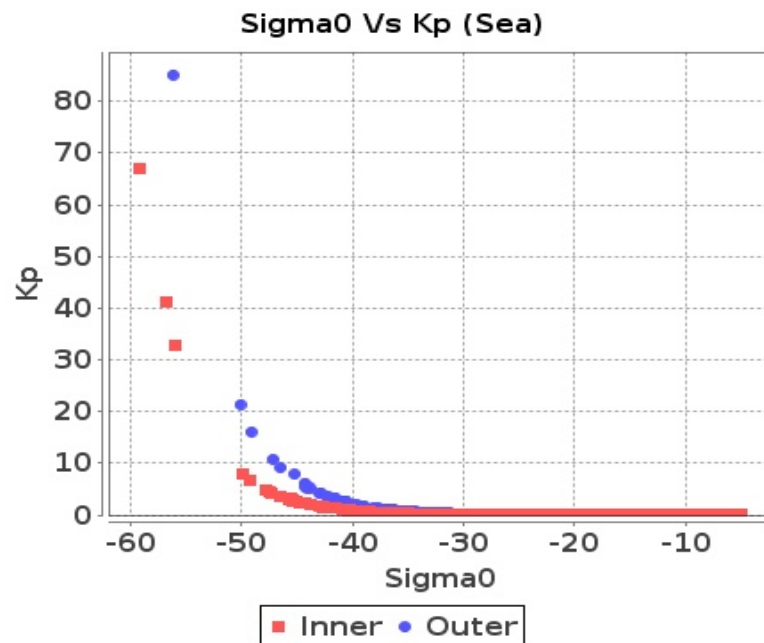


# Sigma0 Behaviour(Sigma0 Vs Kp)

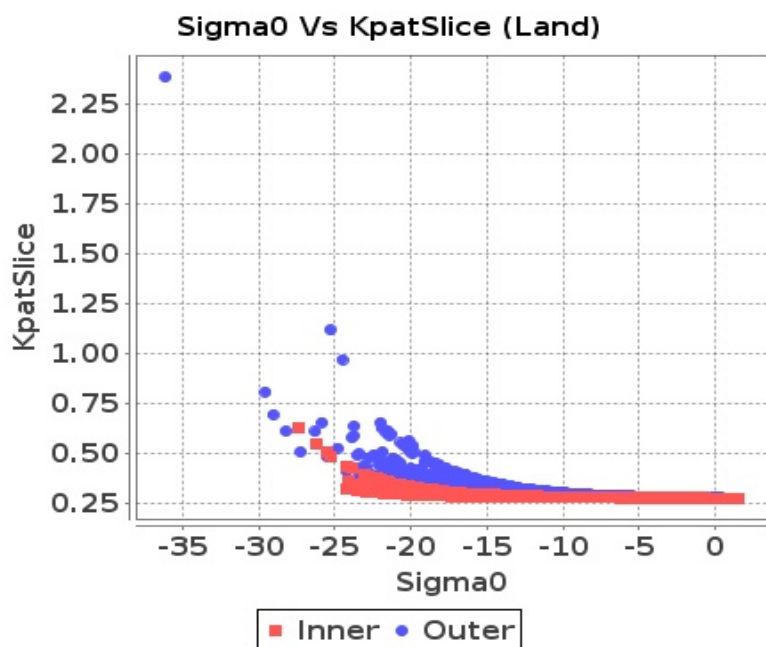
Footprint-Land



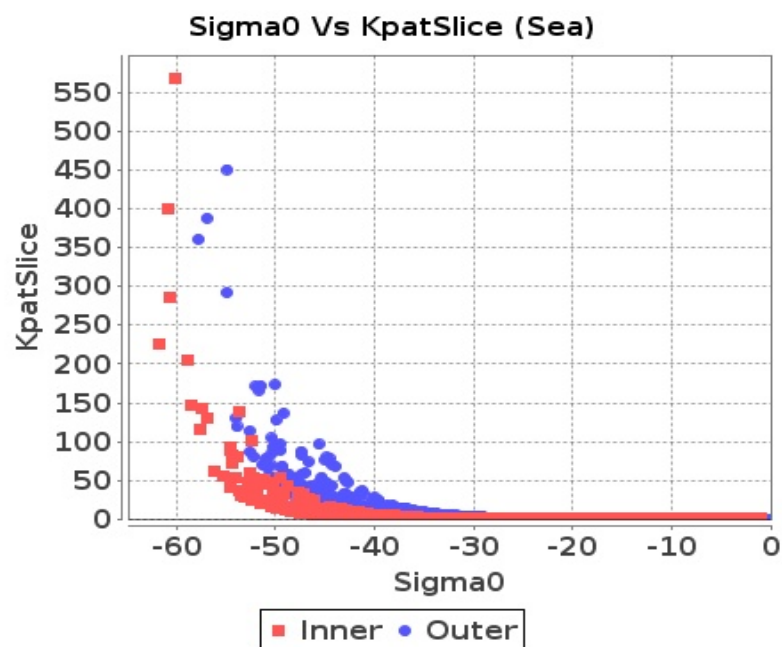
Footprint-Sea



Slice-Land



Slice-Sea

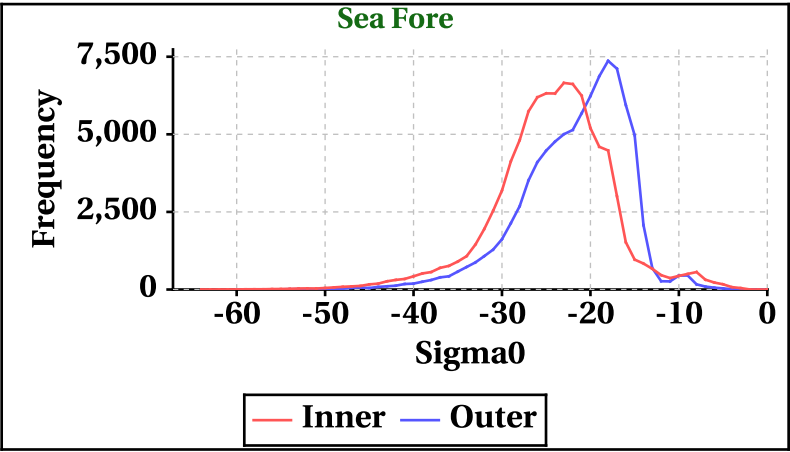
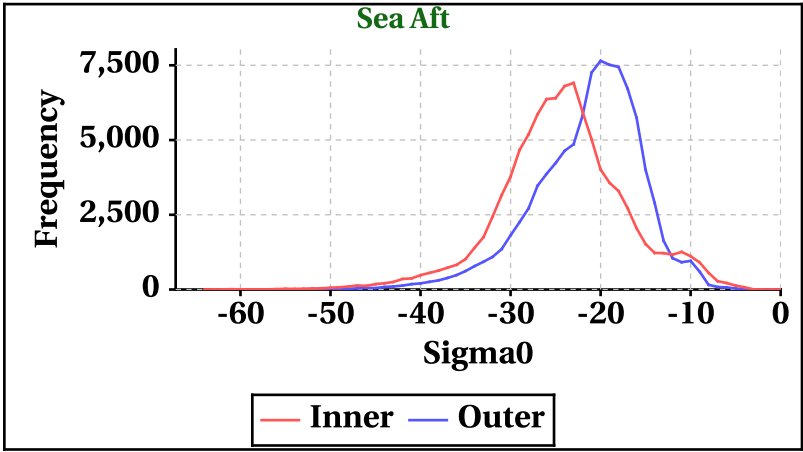
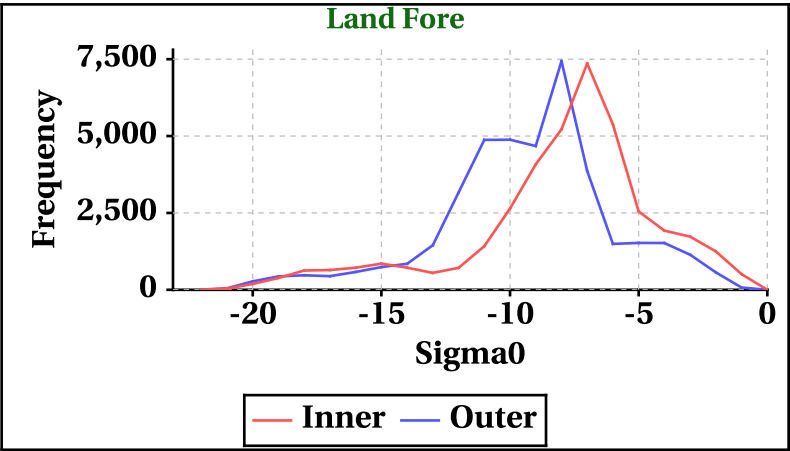
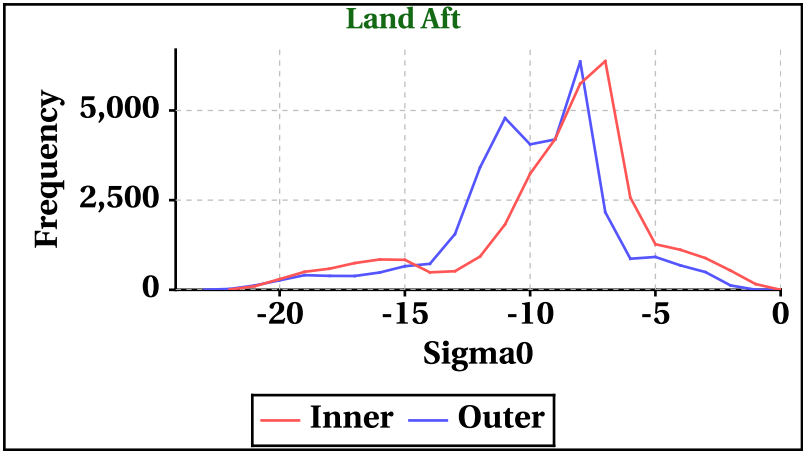


Dynamic Range (Data Histograms)

Sigma0(db)

Inner Beam (HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-22	-22	-64	-64
Max	0	0	0	0

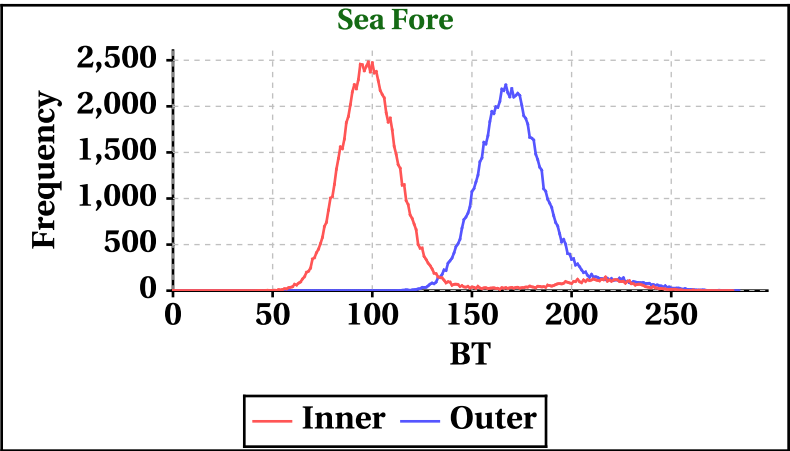
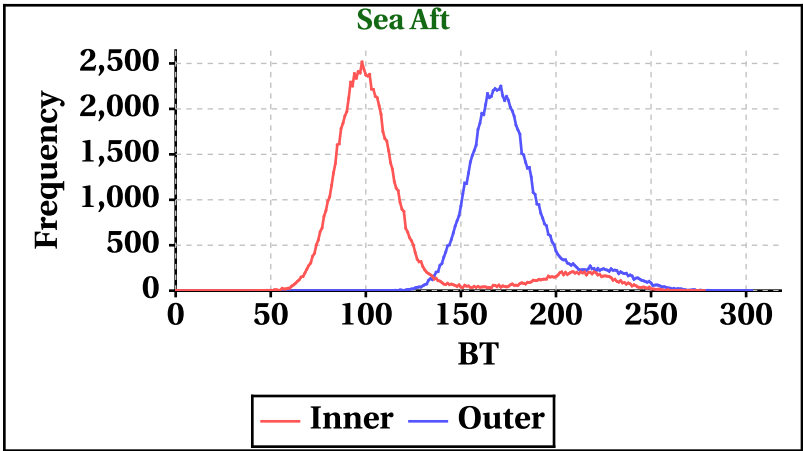
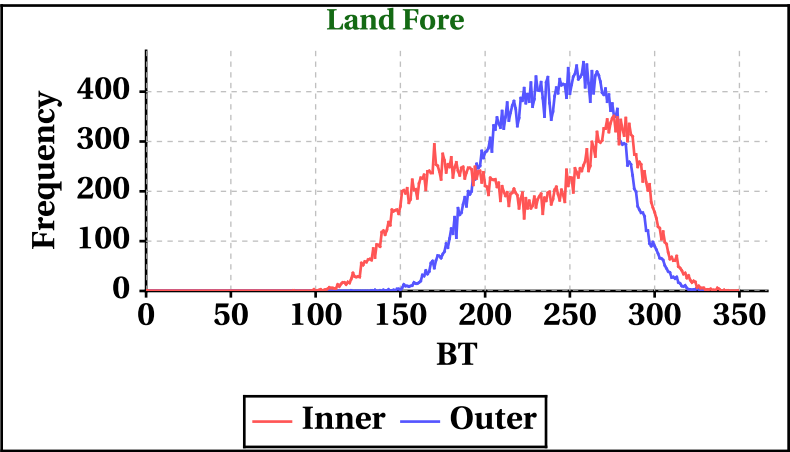
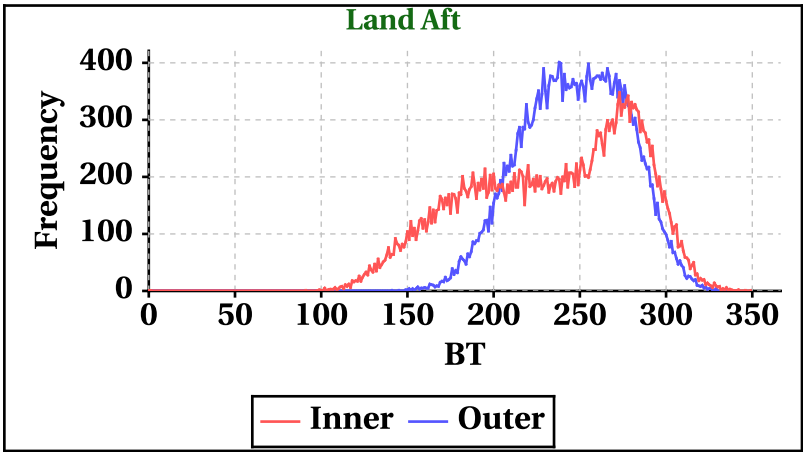
Outer Beam (VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-23	-22	-59	-60
Max	0	0	0	0



Brightness Temperature(K)

Inner Beam(HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	0	0
Max	349	349	278	281

Outer Beam(VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	0	0
Max	336	331	303	284

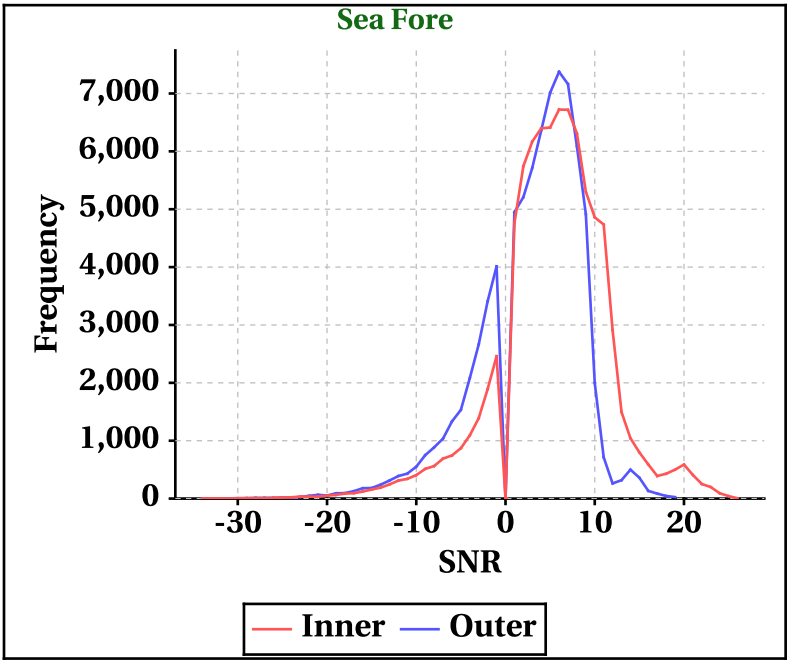
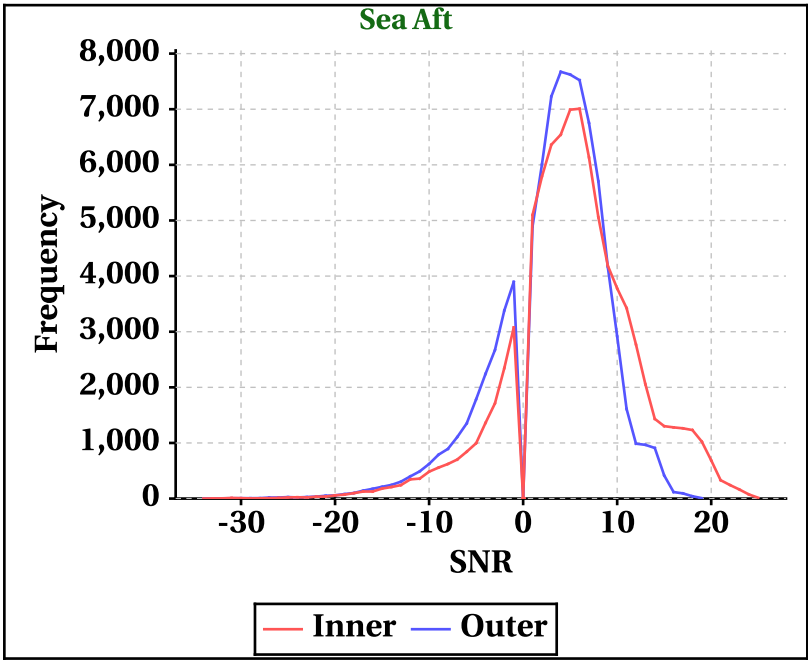
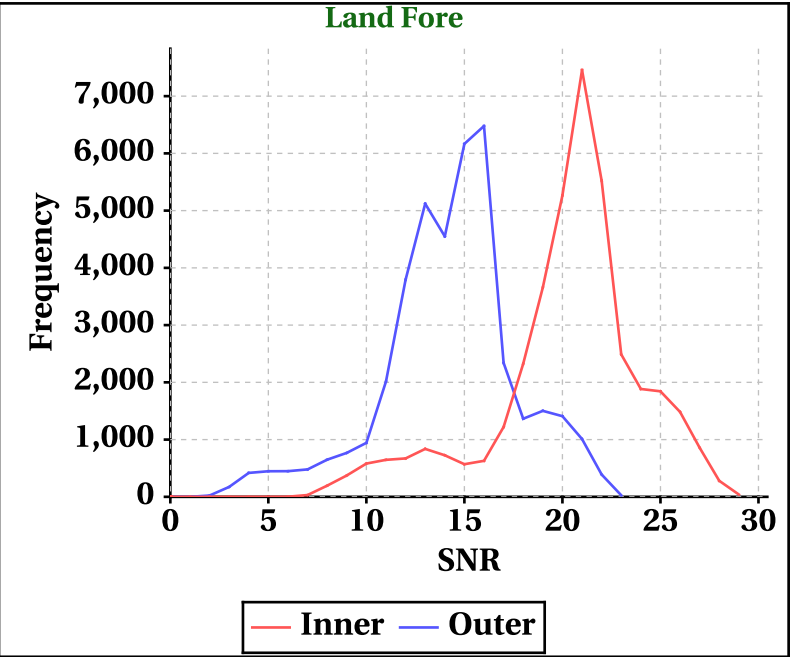
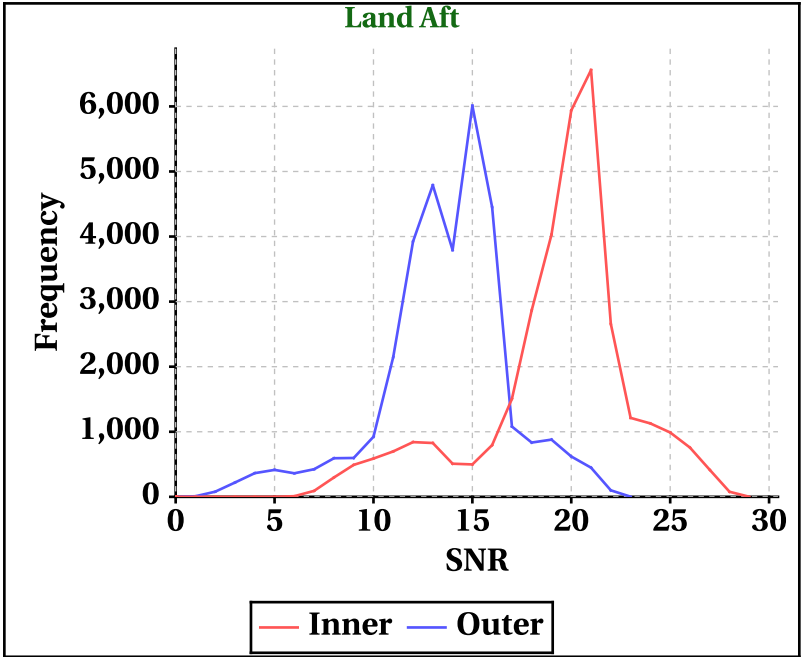


Dynamic Range (Data Histograms)

SNR(dBm)

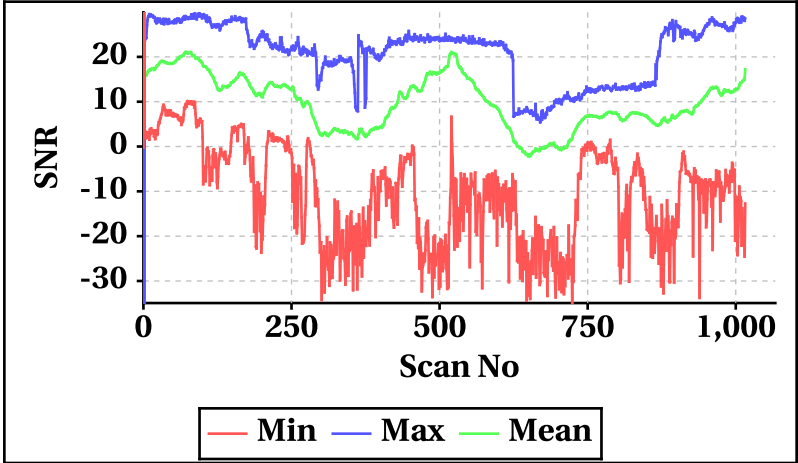
Inner Beam (HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	-34	-34
Max	29	29	25	26

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

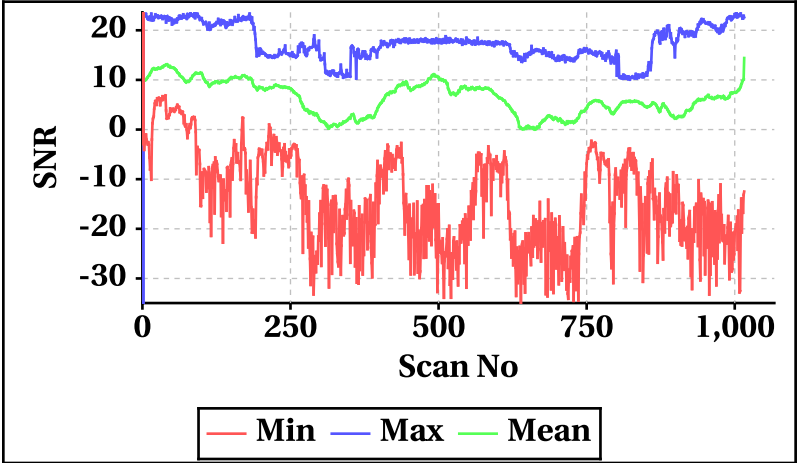


# Orbit-wise behaviour of SNR

Inner Beam (HH)

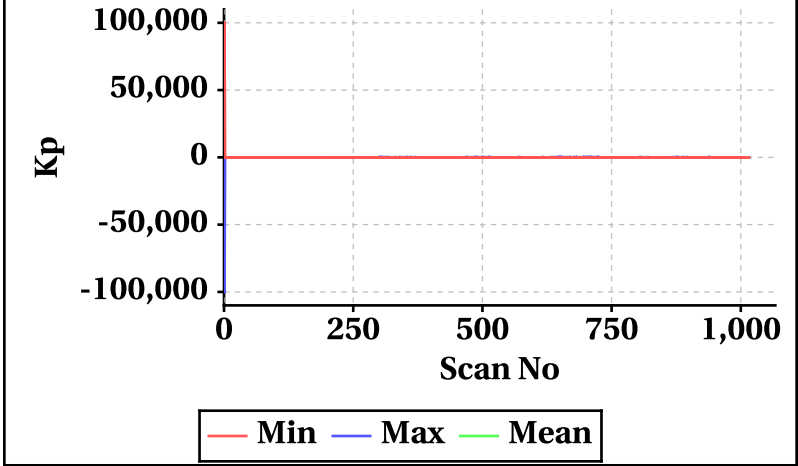


Outer Beam(VV)

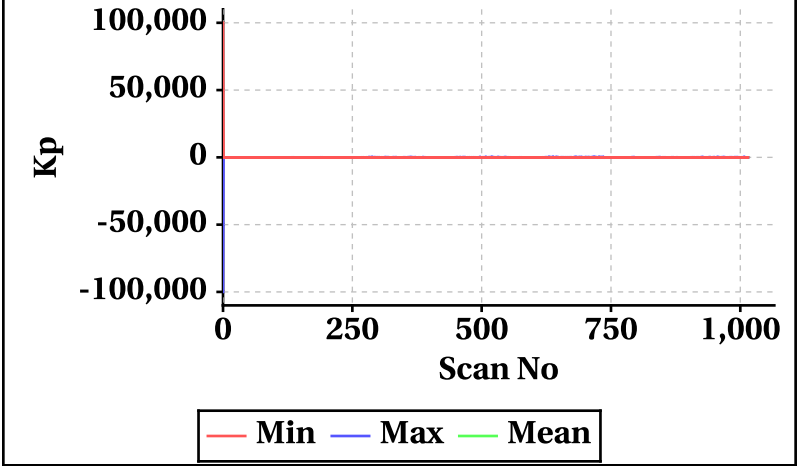


# Orbit-wise behaviour of Kp,Kpa,Kpb,Kpc

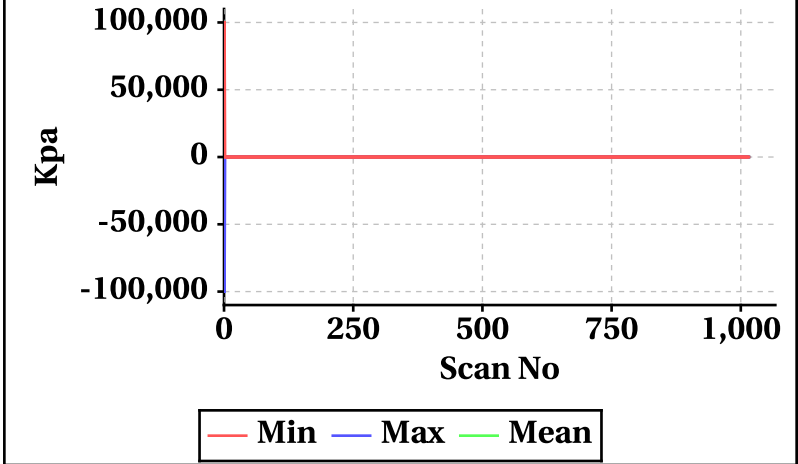
Inner Beam(HH)



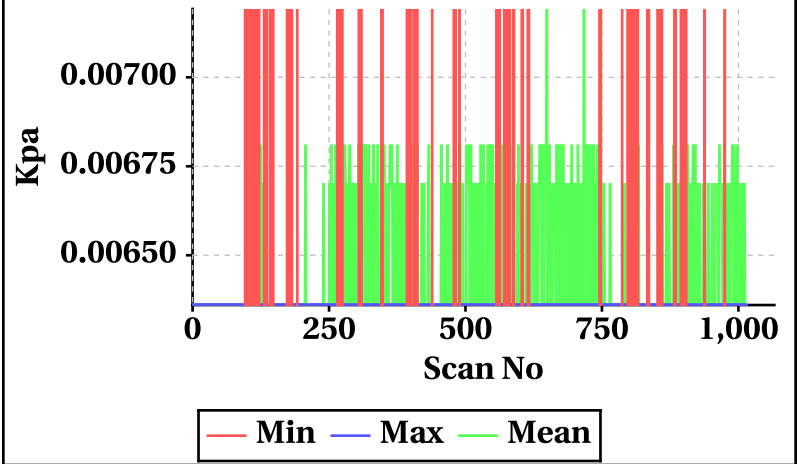
Outer Beam(VV)



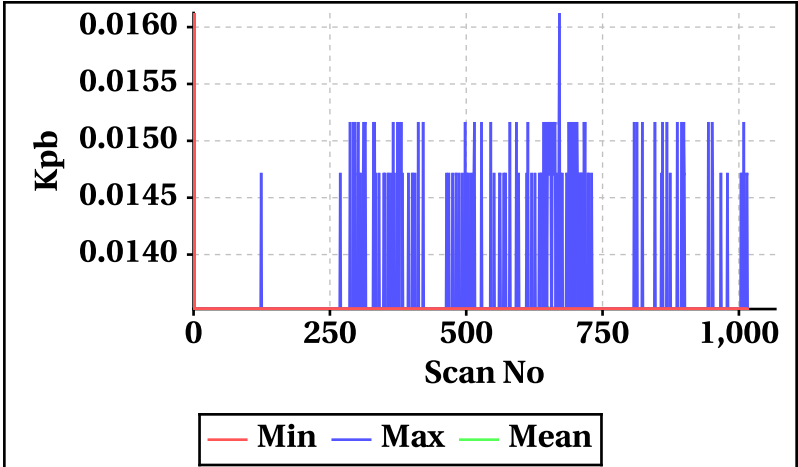
Inner Beam(HH)



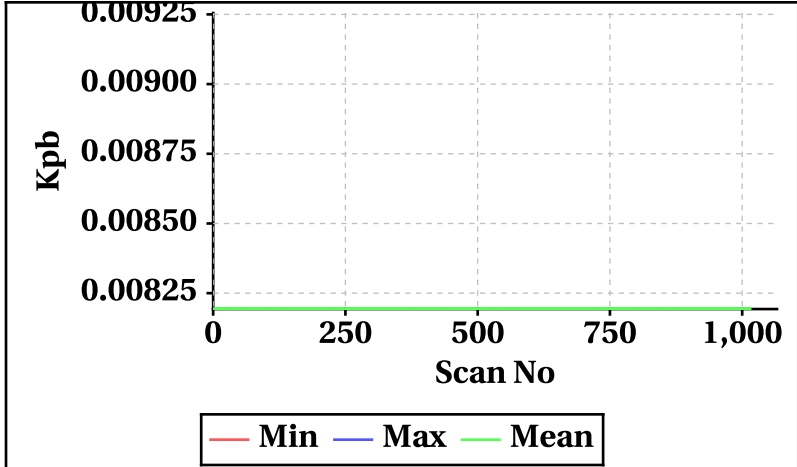
Outer Beam(VV)



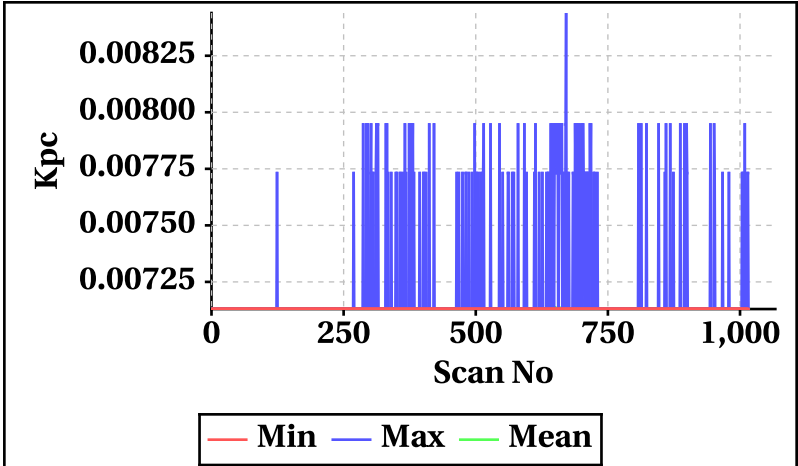
Inner Beam(HH)



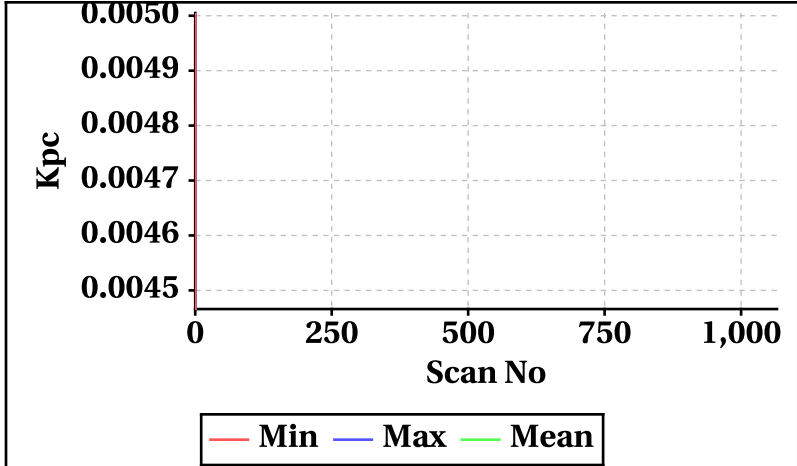
Outer Beam(VV)



Inner Beam(HH)



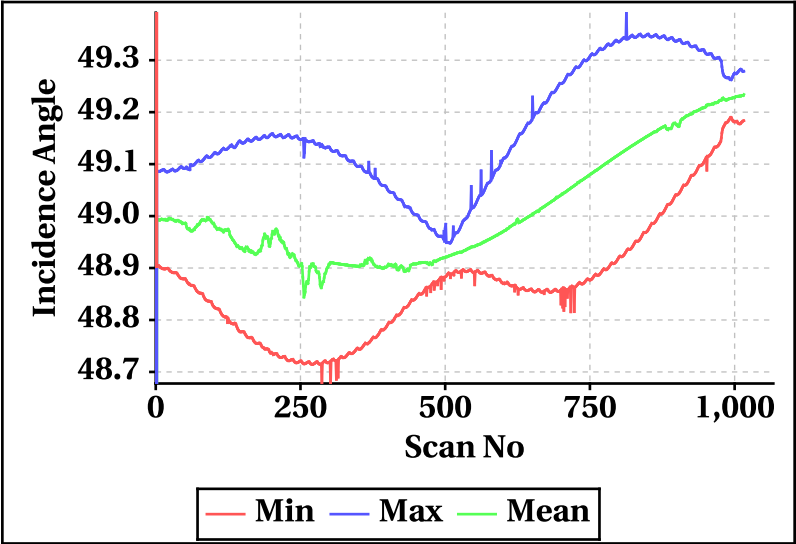
Outer Beam(VV)



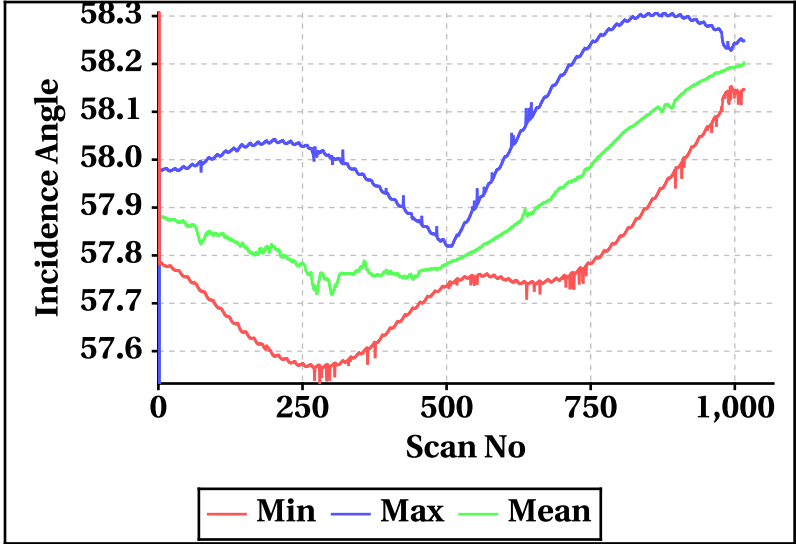


Orbt-wise behaviour of Incidence,Azimuth,Range,X-Factor

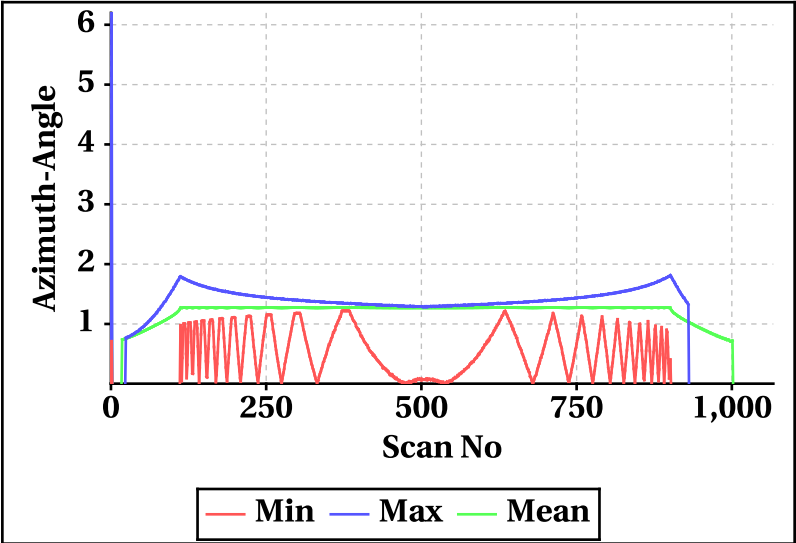
Inner Beam (HH)



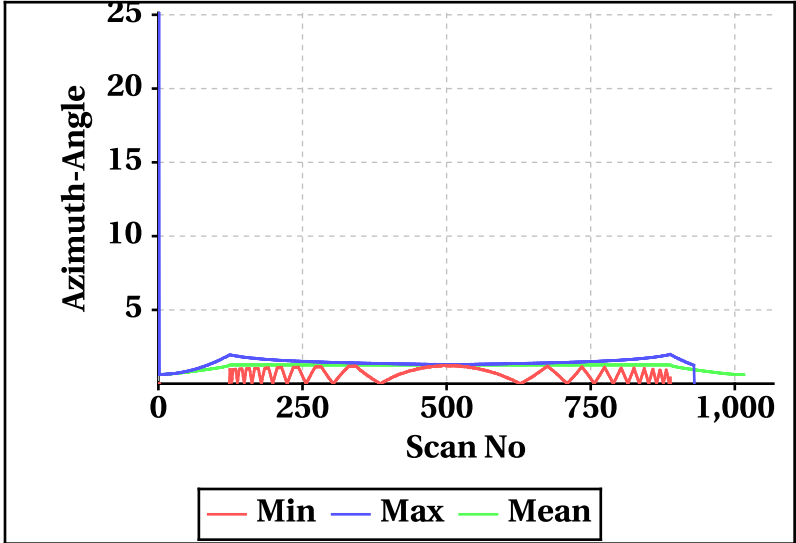
Outer Beam(VV)



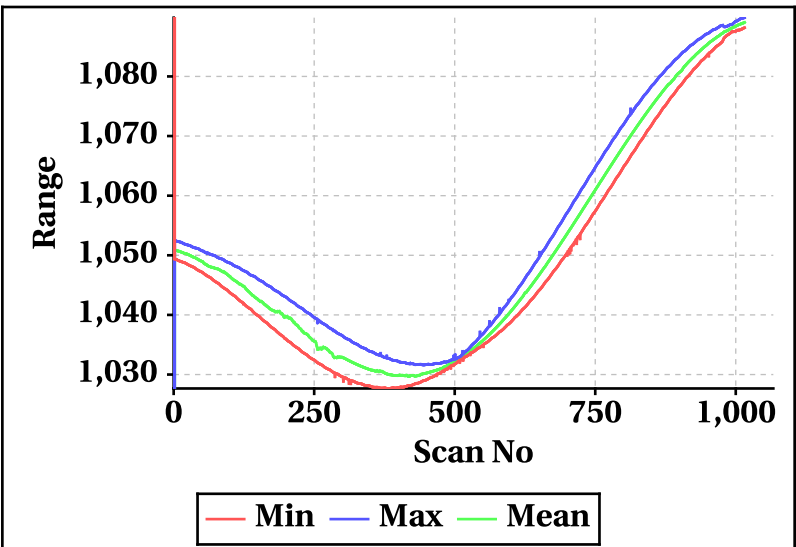
Inner Beam (HH)



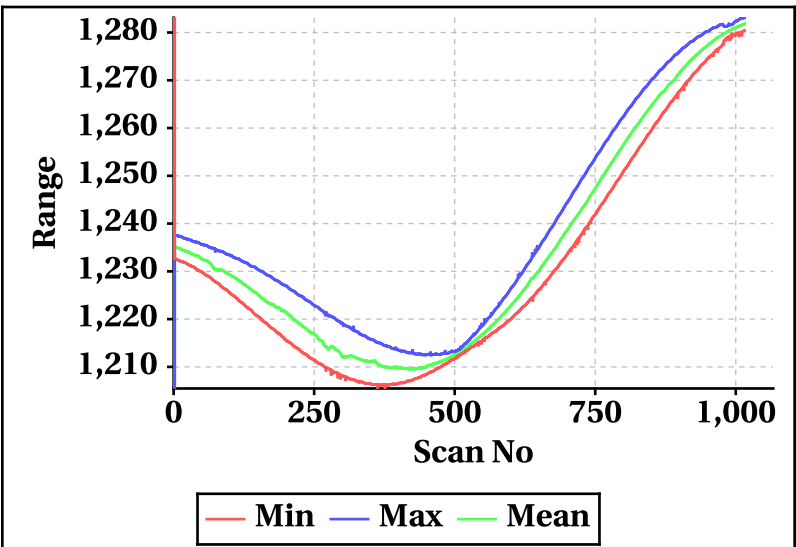
Outer Beam(VV)



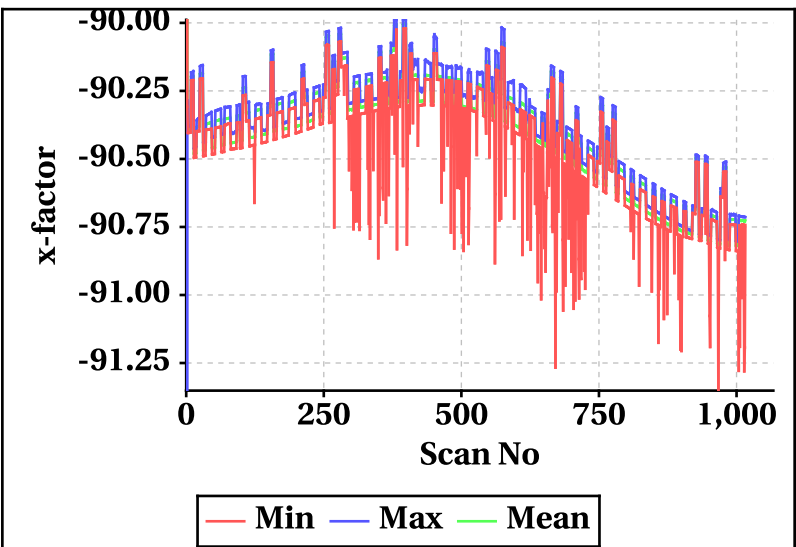
Inner Beam (HH)



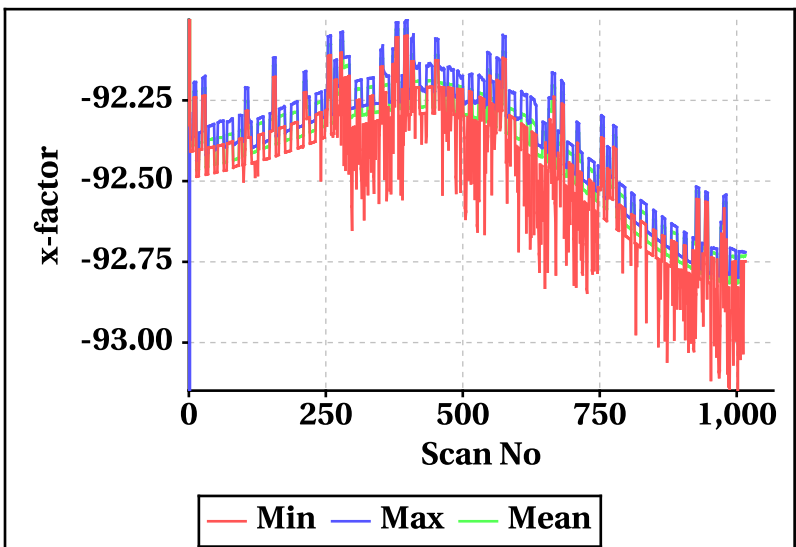
Outer Beam(VV)



Inner Beam (HH)



Outer Beam(VV)

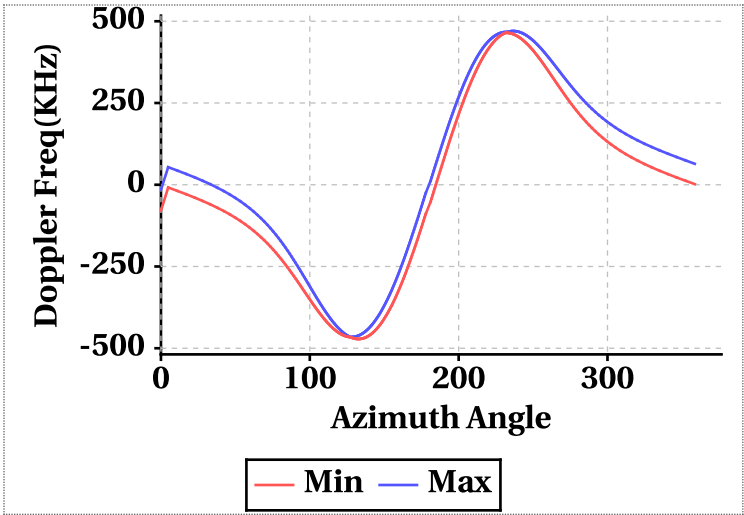


# Doppler Frequency Variation

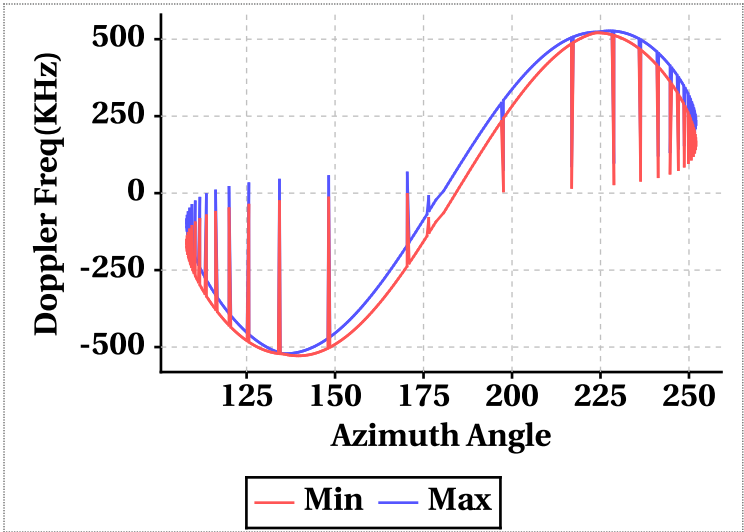
Doppler Frequency(KHz) variation statistics Over the half Orbit

	Inner Beam (HH)	Outer Beam (VV)
Min	-471.70	-528.42
Max	470.02	526.96

Footprint wise Doopler frequency variation Inner Beam (HH)



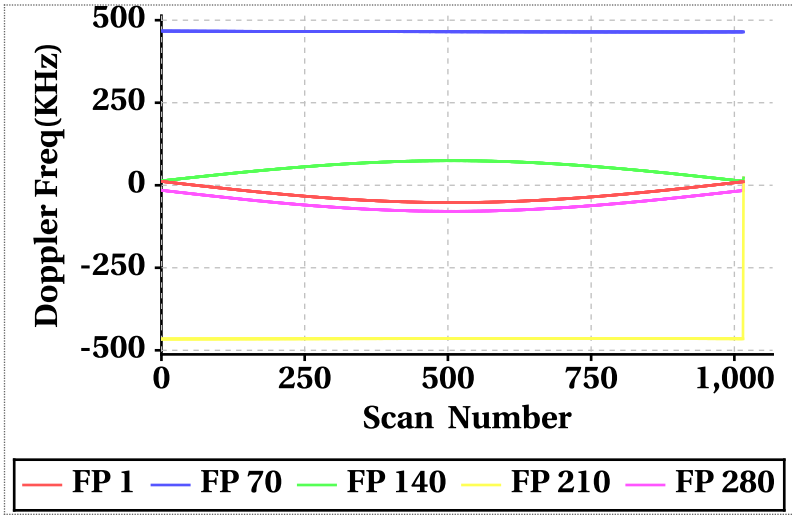
Footprint wise Doopler frequency variation Outer Beam (VV)



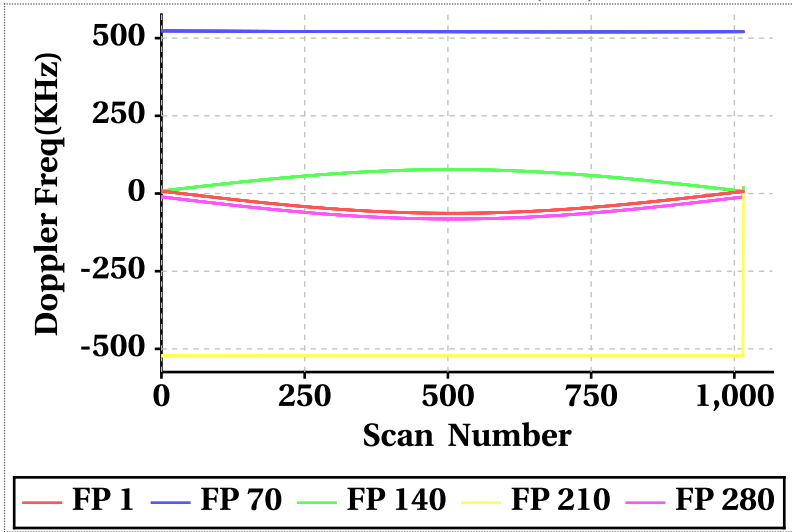
Doppler Frequency(KHz) variation

Doppler_FP	Inner Beam (HH)			Outer Beam (VV)		
	Min	Max	Mean	Min	Max	Mean
Doppler_1	-52.40	11.60	-29.22	-63.66	7.76	-37.75
Doppler_70	464.34	467.08	465.21	520.06	523.26	520.96
Doppler_140	12.20	74.44	51.89	7.30	77.20	51.81
Doppler_210	-465.70	22.32	-464.31	-522.26	18.66	-521.00
Doppler_280	-79.08	22.32	-55.83	-81.96	18.66	-55.99

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

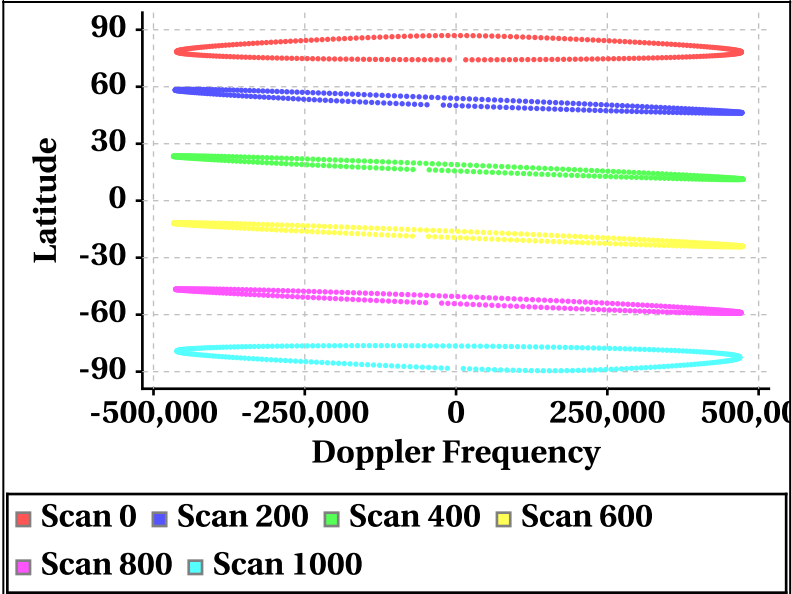


Doppler frequency variation at footprints: 1, 70, 140, 210 & 280 Outer Beam (VV)

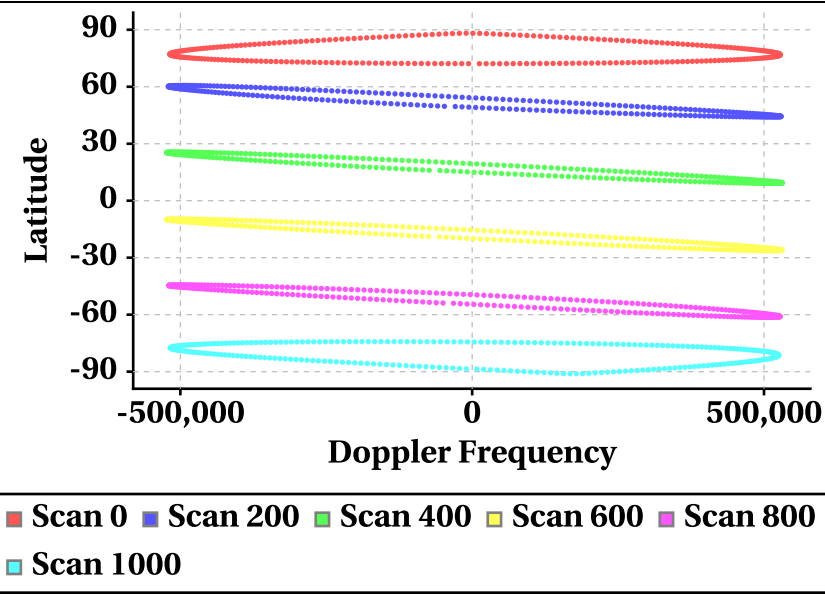


## Latitude Vs Doppler Frequency

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



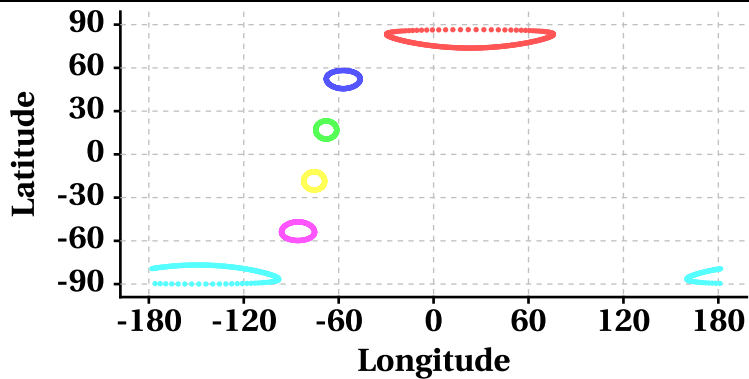
Doppler Frequency at Scan Interval of 200 [Outer Beam(VV)]



# Parameter as a function of Latitude

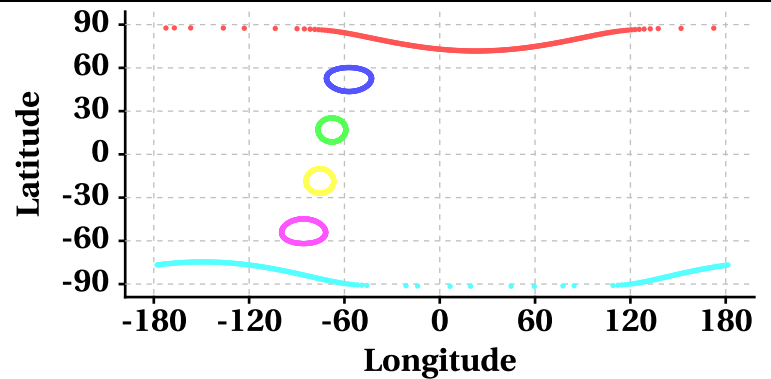
## Latitude Vs Longitude

Scan Trace [Inner Beam(HH)]



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

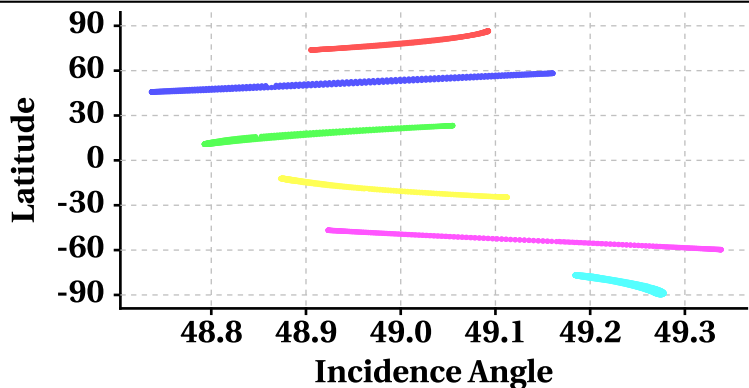
Scan Trace [Outer Beam (VV)]



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

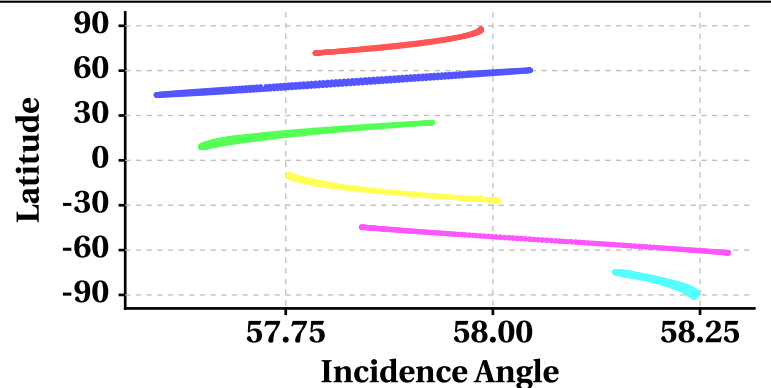
## Latitude Vs Incidence Angle

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



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

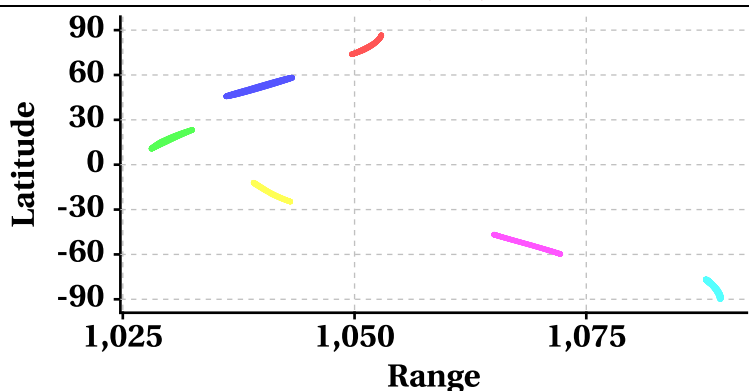
Incidence Angle at Scan Interval of 200  
[Outer Beam (VV)]



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

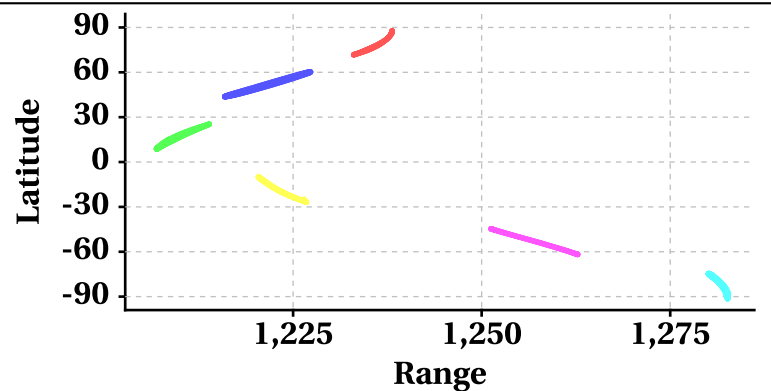
## Latitude Vs Range

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



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

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



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



Variation in Orbit and Attitude Parameters

