

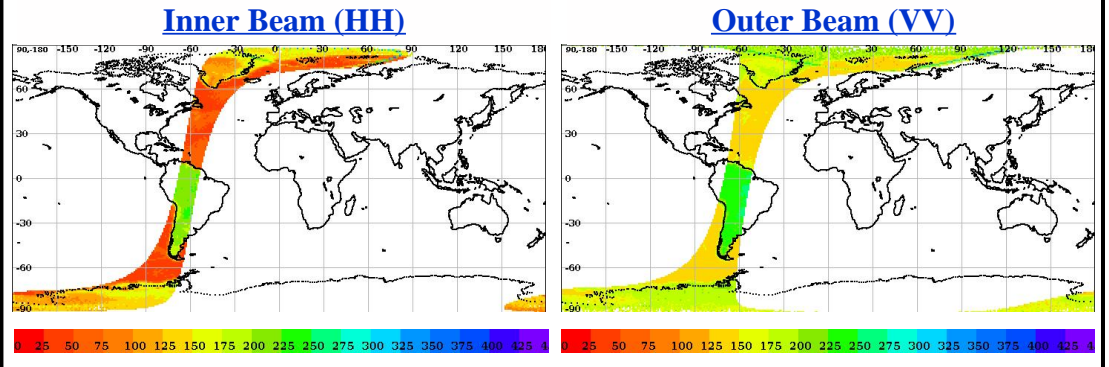
# SCATSAT-1 Scatterometer Level-1B Data Quality Evaluation Report

## 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)
- LIB Parameter as a function of Latitude
- Half Orbit OAT Behaviour

<b>Satellite Id</b>	ScatSat-1	<b>Start Orbit</b>	1282	<b>Total Scans</b>	1018
<b>Sensor Name</b>	Scatterometer	<b>End Orbit</b>	1283	<b>No of Inner FootPrints</b>	281
<b>Processor Version</b>	1.0	<b>Rev. Number</b>	01282_01283	<b>No Of Outer FootPrints</b>	282
<b>Half Orbit Direction</b>	NS	<b>Data Production Date</b>	23-12-2016	<b>No. Of Inner Slices</b>	9
<b>Equator Crossing Date</b>	23-12-2016	<b>Equator Crossing Time</b>	13:13:32.000	<b>No Of Outer Slices</b>	15

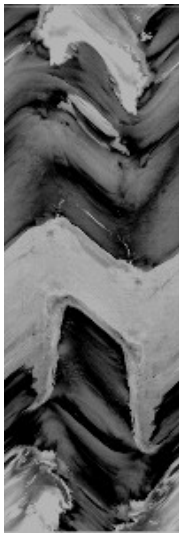
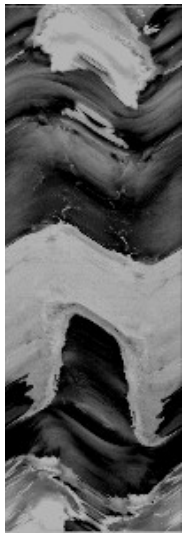
## Brightness Temperature(k) Footprint trace



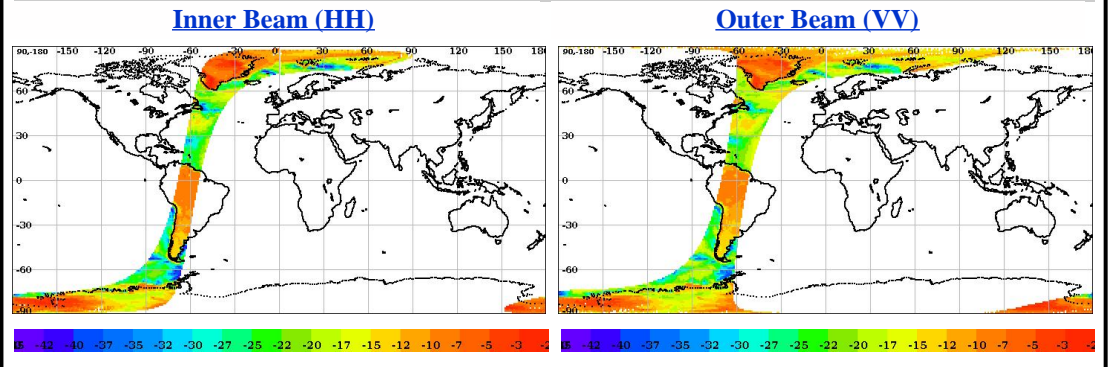
## Image Snapshot for Inner & Outer Beam

Inner (HH)

Outer (VV)



## Sigma0(dB) Footprint trace



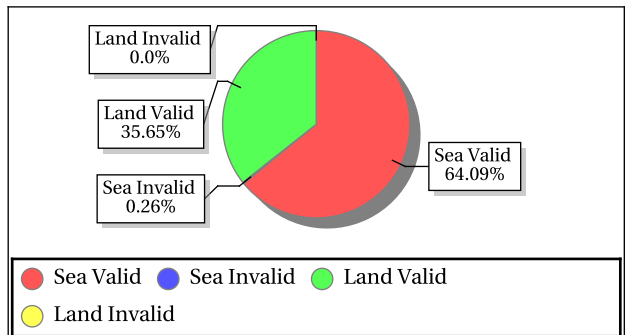
## Invalid and Poor Sigma-0 Quality Flag Statistics for Inner/Outer Slices\*

Sigma-0 Flags	Inner Beam	Outer Beam
Invalid Sigma0(%)	0.26	0.26
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 (-96dB) (%)	0.0	0.0
Sigma0 > upper bound (0 dB) (%)	0.00	0.00
SNR < -65 dB (%)	100.0	100.0

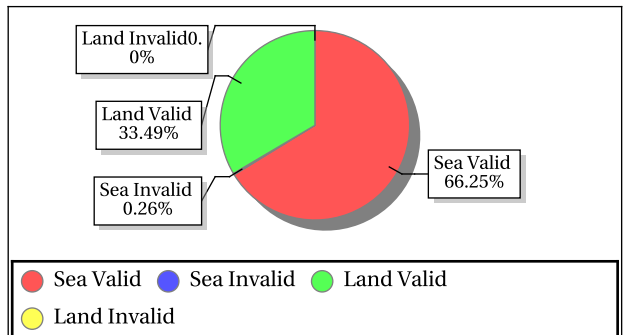
\*DP Format Document

## 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	-5.24	-3.89	-4.65	0.49	89.88	118.47	100.89	9.92
GreenLand_2	77.50	-41.50	Inner	ASC	Fore	-5.42	-4.28	-4.84	0.40	95.46	114.88	103.96	6.30
GreenLand_3	71.55	-42.45	Inner	ASC	Aft	-11.53	-9.06	-10.11	0.72	104.66	151.24	123.44	13.30
GreenLand_3	71.55	-42.45	Inner	ASC	Fore	-10.86	-8.21	-9.59	0.62	74.53	133.90	112.49	16.18
Amazon_3	-6.00	-61.00	Inner	ASC	Aft	-9.51	-6.97	-8.39	0.62	176.60	276.21	228.29	19.69
Amazon_3	-6.00	-61.00	Inner	ASC	Fore	-9.08	-6.91	-7.79	0.53	182.69	256.11	220.86	15.20
GreenLand_1	74.69	-42.50	Inner	ASC	Aft	-9.21	-6.35	-8.10	0.78	88.17	147.18	115.55	15.80
GreenLand_1	74.69	-42.50	Inner	ASC	Fore	-9.35	-6.43	-8.37	0.73	90.89	126.16	108.39	12.32
Amazon_2	-3.00	-61.00	Inner	ASC	Aft	-11.87	-7.99	-9.25	0.88	168.55	254.40	208.27	19.76
Amazon_2	-3.00	-61.00	Inner	ASC	Fore	-10.88	-6.00	-8.37	0.89	157.77	236.00	203.54	18.98
Amazon_1	0.00	-67.00	Inner	ASC	Aft	-9.39	-6.72	-7.94	0.58	170.08	252.20	217.00	16.90
Amazon_1	0.00	-67.00	Inner	ASC	Fore	-9.10	-4.92	-7.51	0.66	181.56	259.30	217.89	14.56
GreenLand_2	77.50	-41.50	Outer	ASC	Aft	-5.79	-4.82	-5.24	0.37	141.69	169.34	158.94	9.58
GreenLand_2	77.50	-41.50	Outer	ASC	Fore	-5.92	-5.01	-5.50	0.37	150.89	173.60	158.75	8.78
GreenLand_3	71.55	-42.45	Outer	ASC	Aft	-11.34	-9.61	-10.82	0.49	171.95	209.67	189.45	10.49
GreenLand_3	71.55	-42.45	Outer	ASC	Fore	-11.75	-10.28	-11.19	0.39	158.17	189.50	177.67	8.49
Amazon_3	-6.00	-61.00	Outer	ASC	Aft	-9.77	-7.78	-9.11	0.41	204.67	295.89	249.03	18.47
Amazon_3	-6.00	-61.00	Outer	ASC	Fore	-10.10	-8.26	-9.21	0.44	202.43	251.25	233.11	11.62
GreenLand_1	74.69	-42.50	Outer	ASC	Aft	-9.85	-8.25	-8.93	0.46	158.29	208.44	173.94	13.59
GreenLand_1	74.69	-42.50	Outer	ASC	Fore	-9.41	-7.85	-8.61	0.57	146.41	191.30	174.71	13.13
Amazon_2	-3.00	-61.00	Outer	ASC	Aft	-11.56	-8.79	-9.97	0.76	221.53	274.13	247.33	12.86
Amazon_2	-3.00	-61.00	Outer	ASC	Fore	-11.31	-8.59	-9.82	0.72	202.49	257.07	229.24	15.35
Amazon_1	0.00	-67.00	Outer	ASC	Aft	-9.85	-8.05	-9.01	0.44	205.39	274.10	240.43	16.43



<b>Site Name</b>	<b>Center Lat</b>	<b>Center Lon</b>	<b>Beam</b>	<b>Node</b>	<b>ScanDir</b>	<b>Sigma0 Min</b>	<b>Sigma0 Max</b>	<b>Sigma0 Mean</b>	<b>Sigma0 Std</b>	<b>BT Min</b>	<b>BT Max</b>	<b>BT Mean</b>	<b>BT Std</b>
Amazon_1	0.00	-67.00	Outer	ASC	Fore	-9.92	-7.68	-8.62	0.48	203.86	272.69	234.97	17.03

## 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	219.35	0.23	1.414	0.10	249.77	0.21	1.420	0.10	0.19	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>	-34.14	25.98	7.87	1.068	-34.71	26.91	8.19	1.053	-0.79	30.76	20.77	39.983	5.15	31.95	21.45	50.004

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	127.58	0.17	1.040	0.08	210.59	0.18	1.254	0.08	0.22	0.08	0.000	0.08	0.14	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	0.00	0.00	0.000	0.00	0.00	0.00	0.000	0.00	0.00	0.00	0.000	0.00	0.00	0.00	0.000
<b>SNR</b>	-32.81	19.37	5.98	0.000	-34.98	19.63	5.51	0.000	-3.53	24.41	15.70	2.032	-0.38	25.31	15.89	3.957

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>	49.05	49.32	49.06	0.000	57.85	58.15	58.00	0.000	Inci.(Inner)	47.10	49.90
<b>Azimuth Diff. (deg)</b>	0.0026	1.29	1.11	0.197	0.0027	1.29	1.13	0.129	Inci.(Outer)	57.30	58.90
<b>Range(Km)</b>	1052.70	1080.40	1064.28	0.000	1234.35	1269.38	1249.00	0.000	Azimuth Diff.	0.60	2.00
<b>X Factor(dbm)</b>	-91.64	-90.27	-90.36	0.000	-93.03	-92.20	-92.21	0.000	Range(Inner)	1025.00	1095.70
<b>Across Distance (Km)</b>	99999.99	-99999.99	0.00	0.000	99999.99	-99999.99	0.00	0.000	Range(Outer)	1210.00	1280.00
<b>Along Distance (Km)</b>	18.81	8640.58	36.68	3.000	18.66	8454.20	36.22	3.000	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

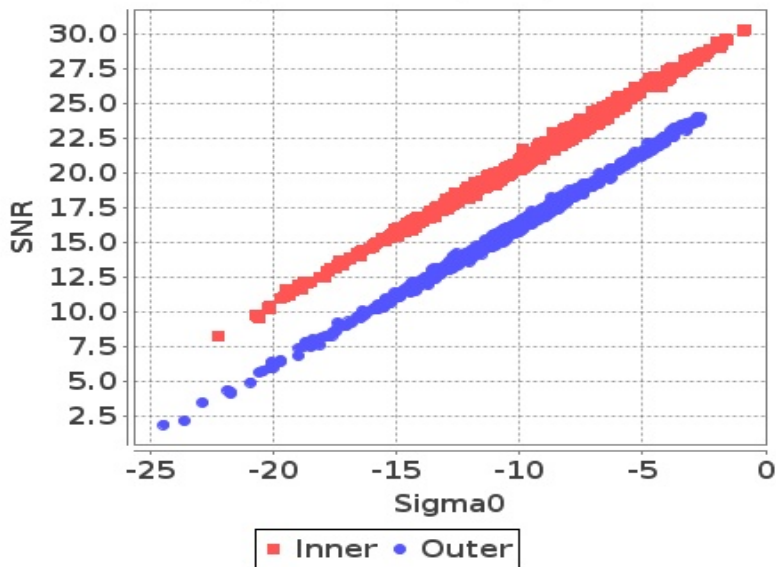
- Normal
- Deviations
- Alarming
- High Errors



## Sigma0 Behaviour (Sigma0 Vs SNR)

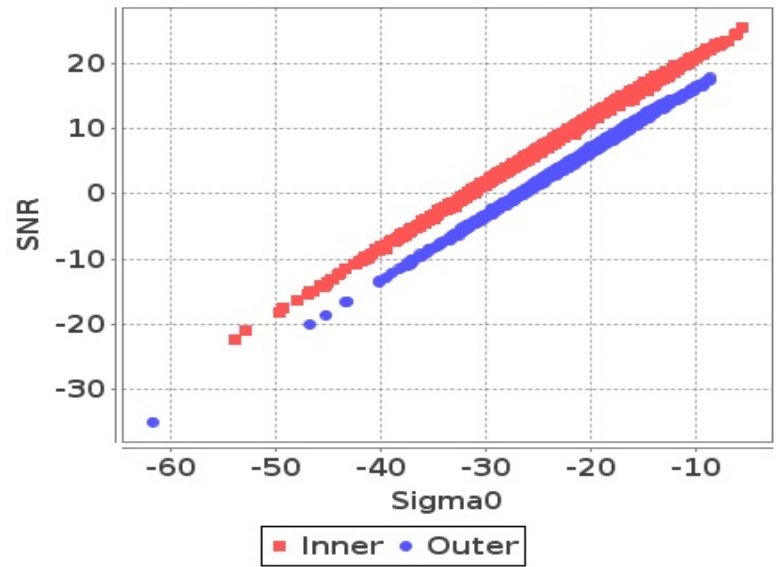
Footprint-Land

Sigma0 Vs SNR (Land)



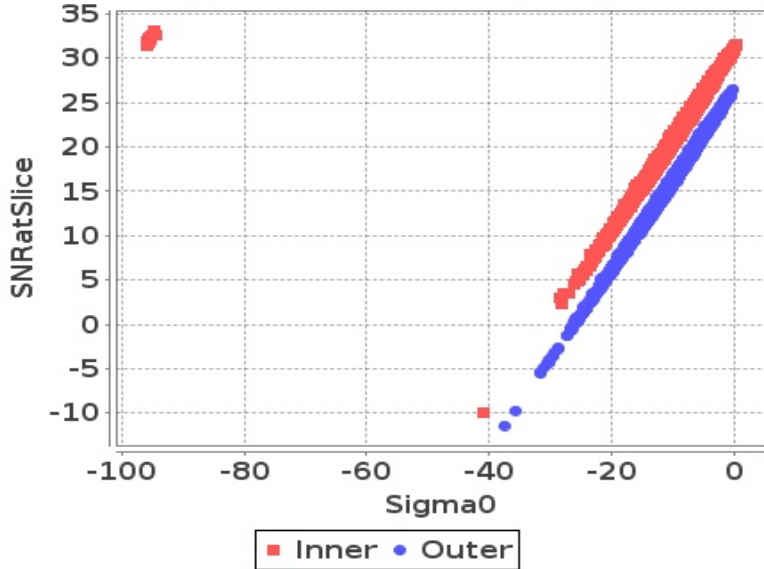
Footprint-Sea

Sigma0 Vs SNR (Sea)



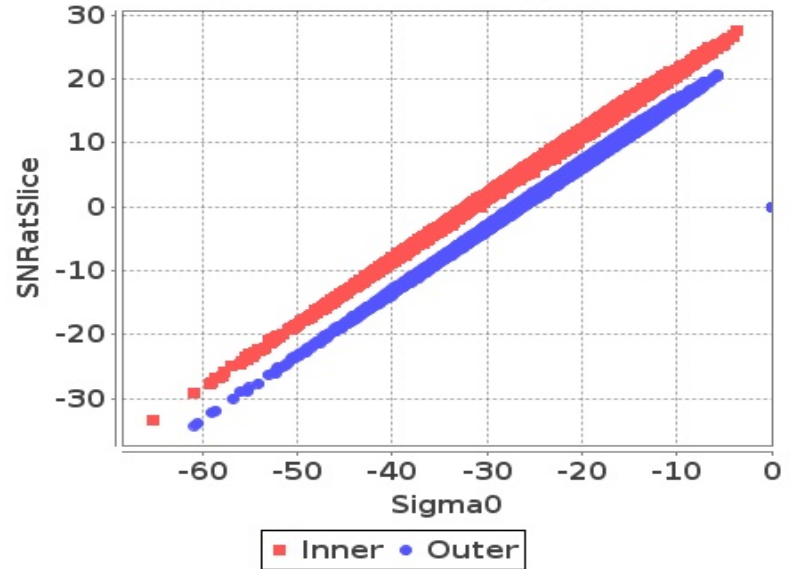
Slice-Land

Sigma0 Vs SNRatSlice (Land)



Slice-Sea

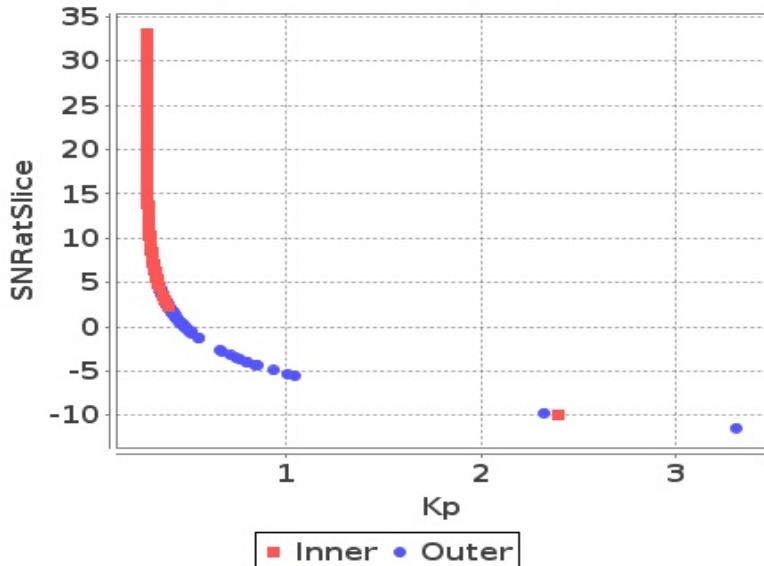
Sigma0 Vs SNRatSlice (Sea)



## Sigma0 Behaviour (Kp Vs SNR)

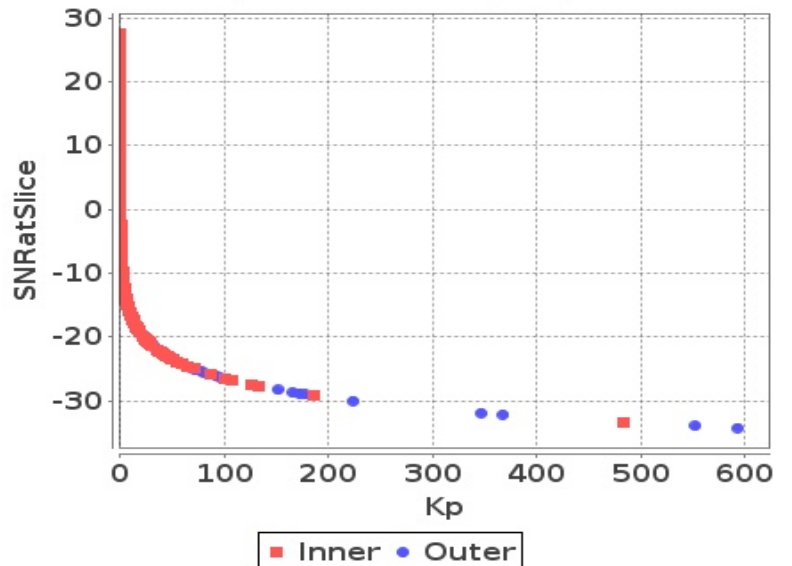
Slice

Kp Vs SNRatSlice (Land)



Slice

Kp Vs SNRatSlice (Sea)

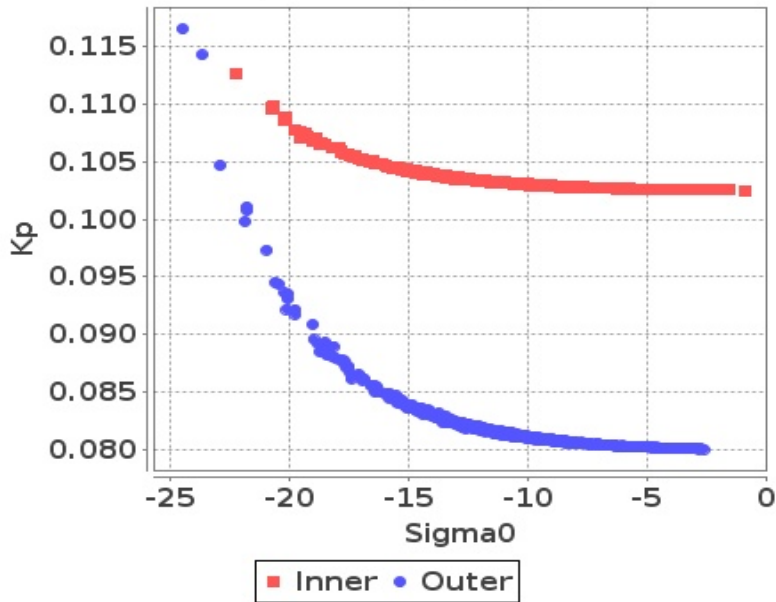




# Sigma0 Behaviour(Sigma0 Vs Kp)

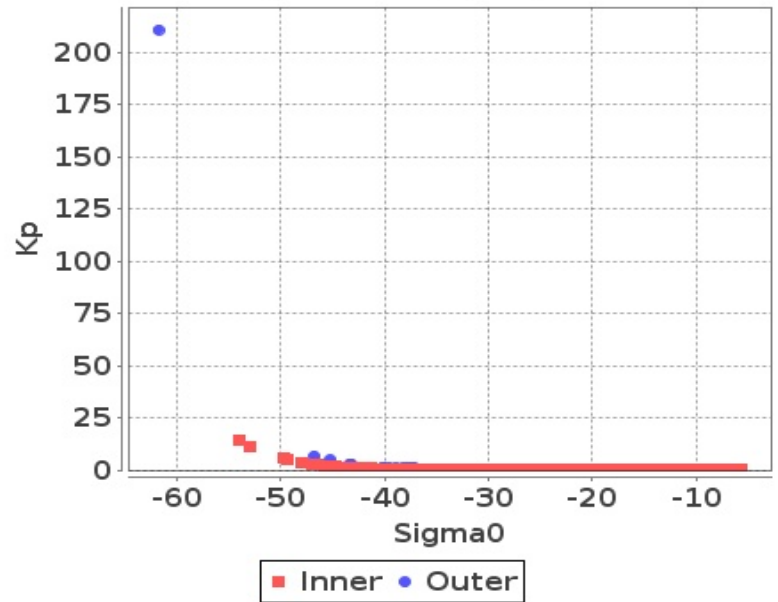
## Footprint-Land

### Sigma0 Vs Kp (Land)



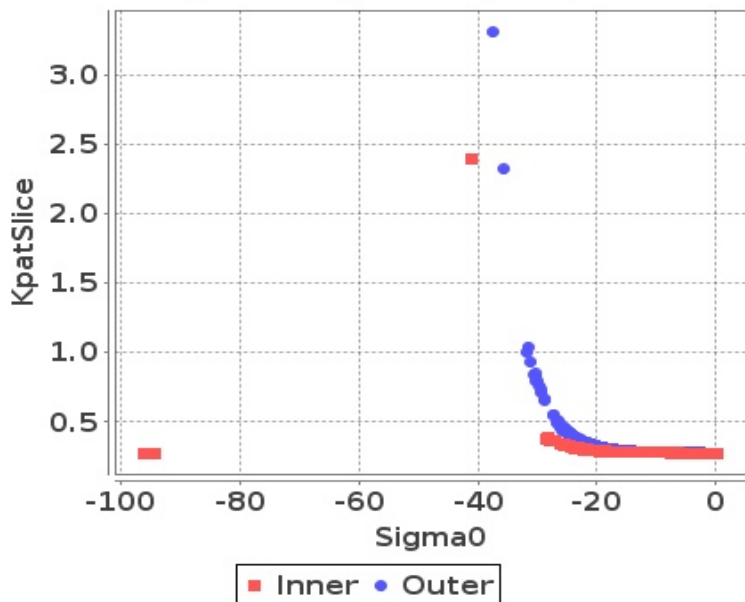
## Footprint-Sea

### Sigma0 Vs Kp (Sea)



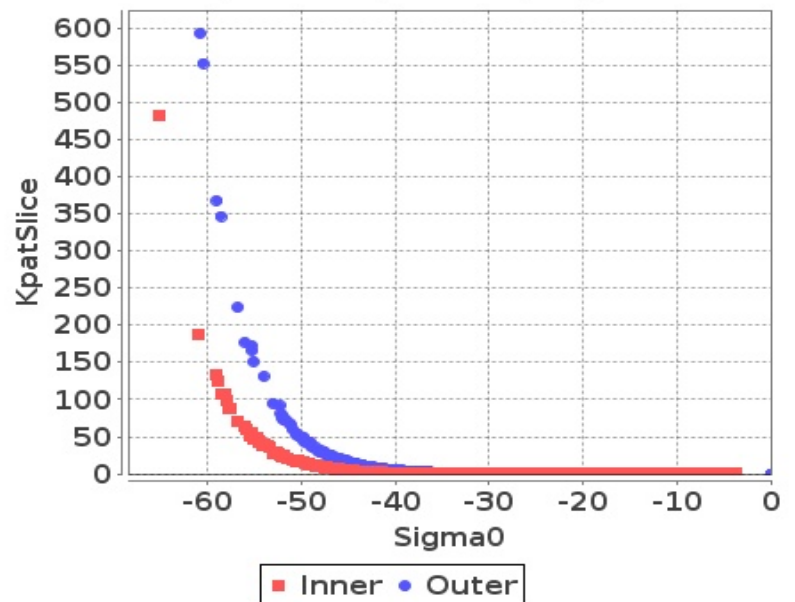
## Slice-Land

### Sigma0 Vs KpatSlice (Land)



## Slice-Sea

### Sigma0 Vs KpatSlice (Sea)

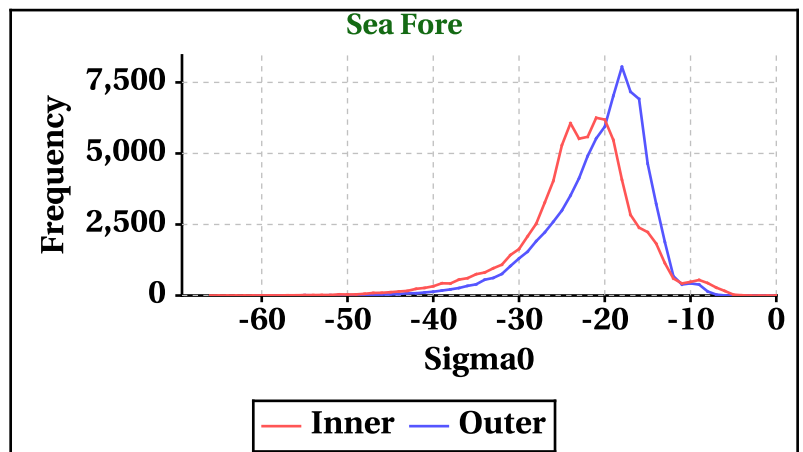
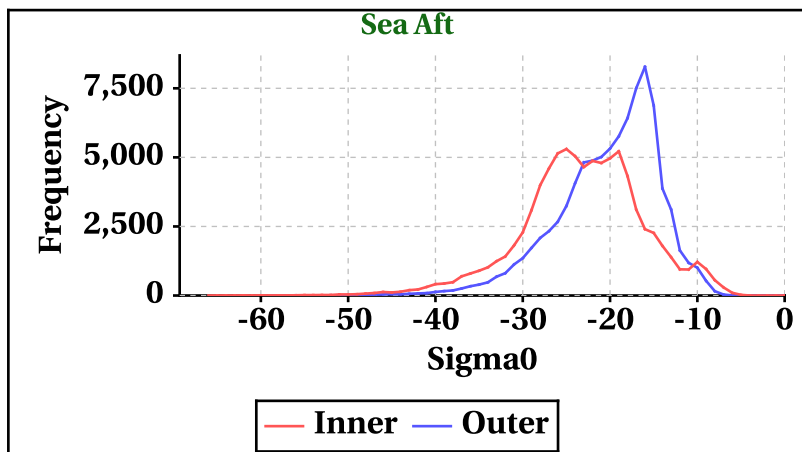
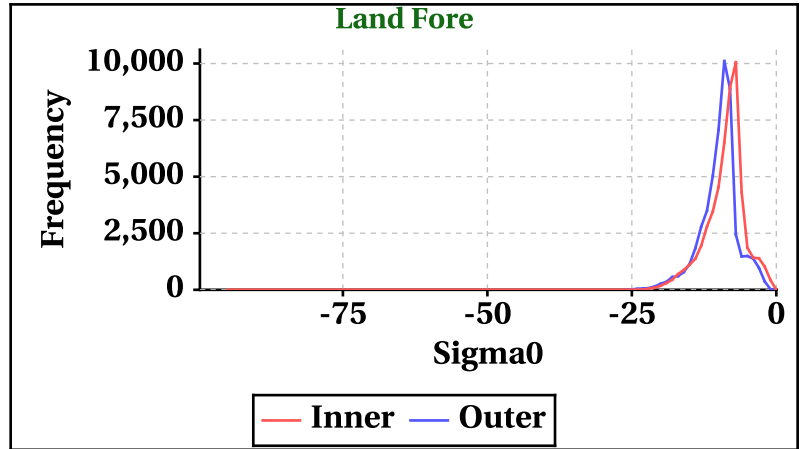
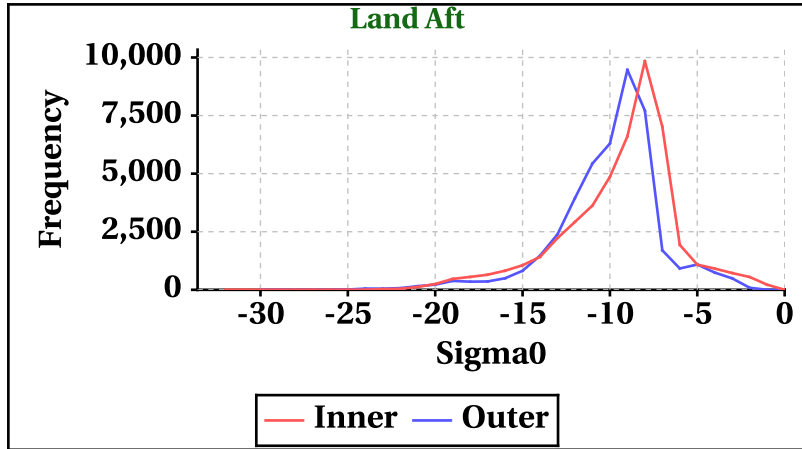


# Dynamic Range (Data Histograms)

## Sigma0(db)

Inner Beam (HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-32	-95	-66	-66
Max	0	0	0	0

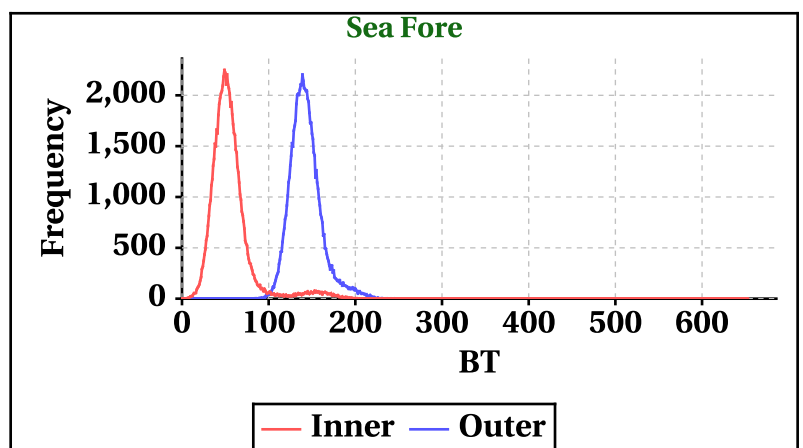
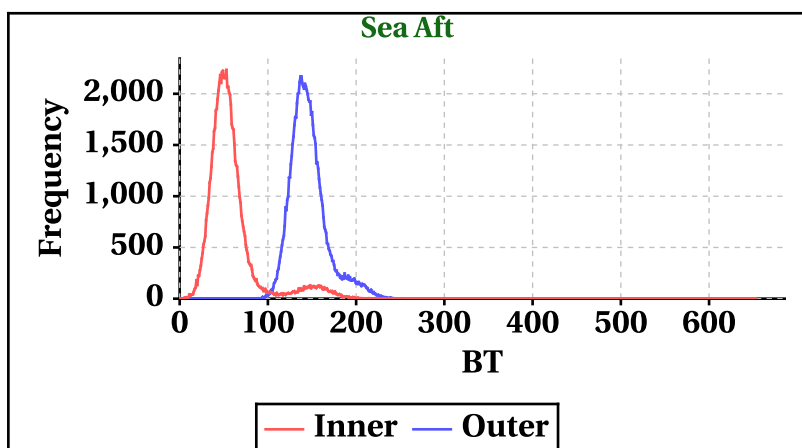
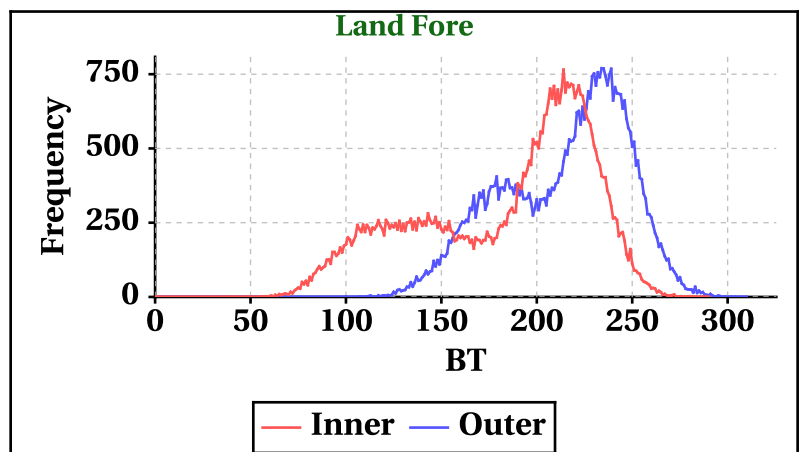
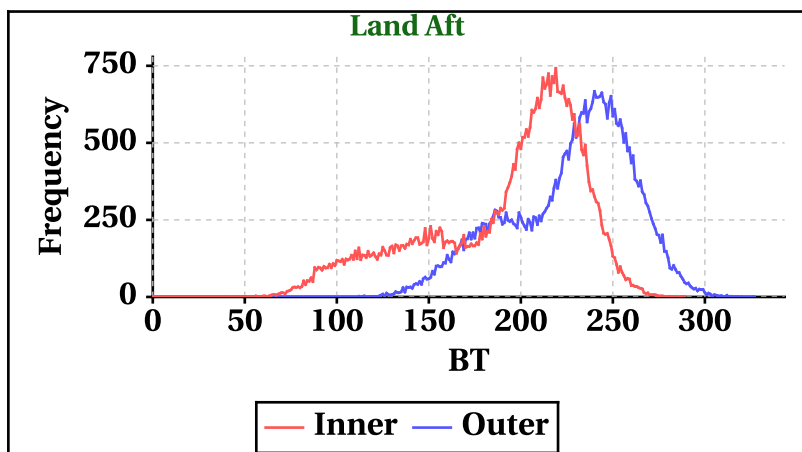
Outer Beam (VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-30	-26	-59	-61
Max	0	0	0	0



## Brightness Temperature(K)

Inner Beam(HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	0	0
Max	289	290	653	653

Outer Beam(VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	0	0
Max	327	310	264	244

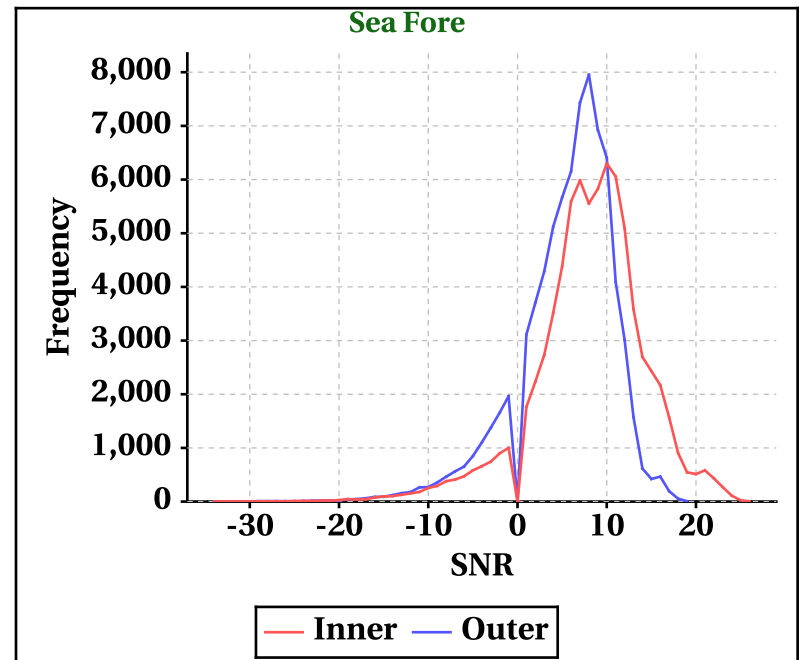
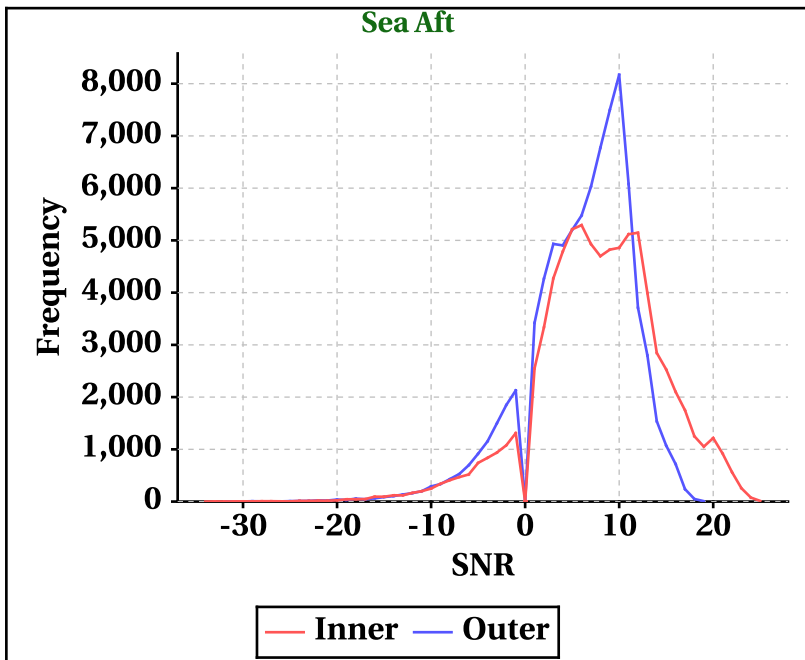
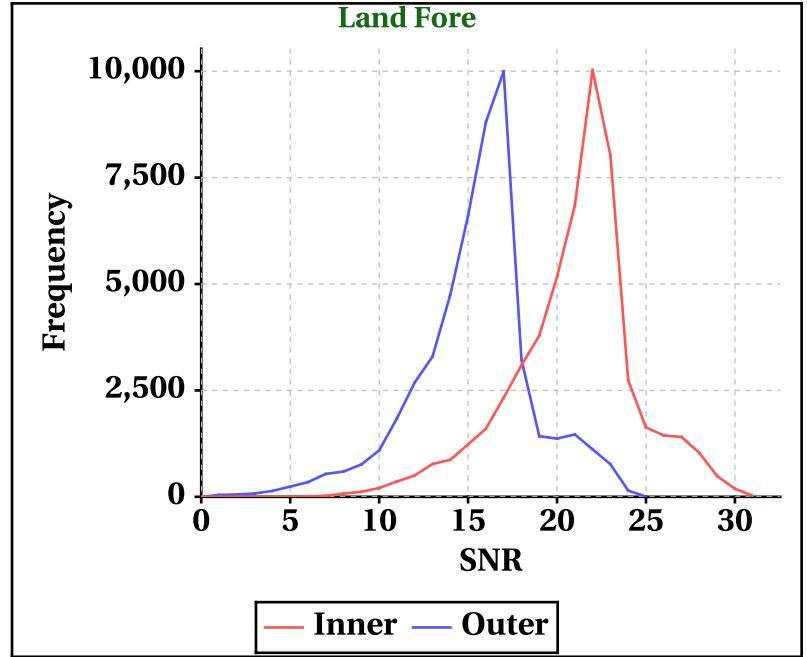
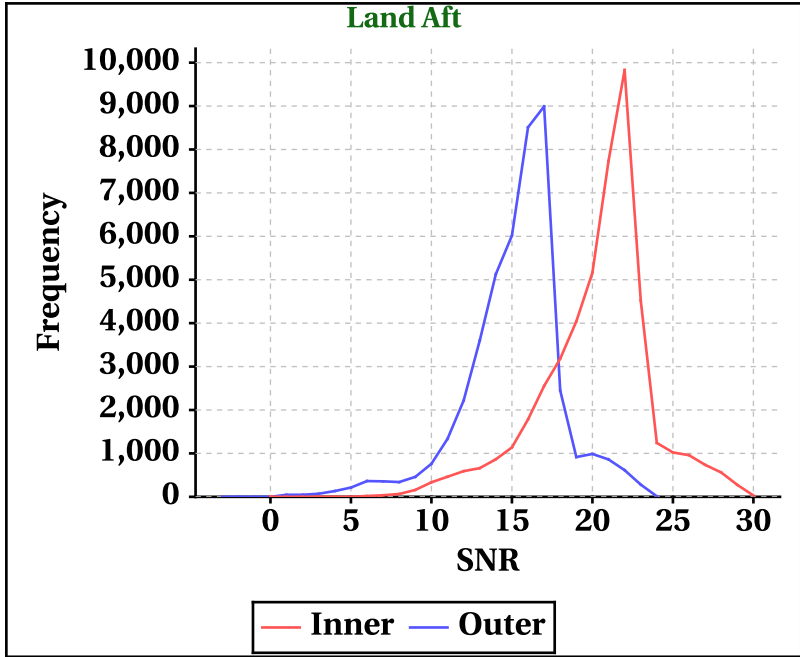


# Dynamic Range (Data Histograms)

## SNR(dBm)

Inner Beam (HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	-34	-34
Max	30	31	25	26

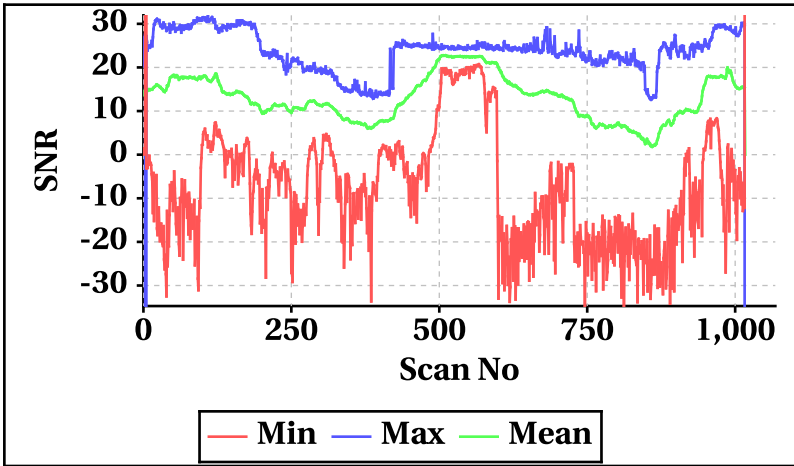
Outer Beam (VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-3	0	-32	-34
Max	24	25	19	19



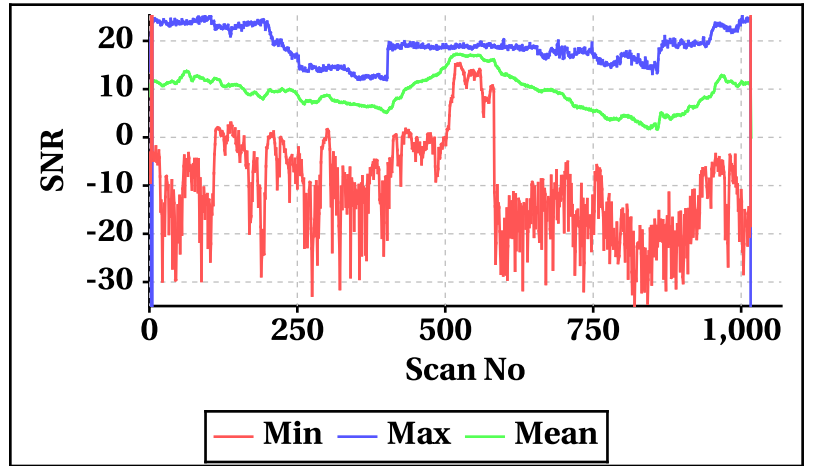


## Orbit-wise behaviour of SNR

Inner Beam (HH)

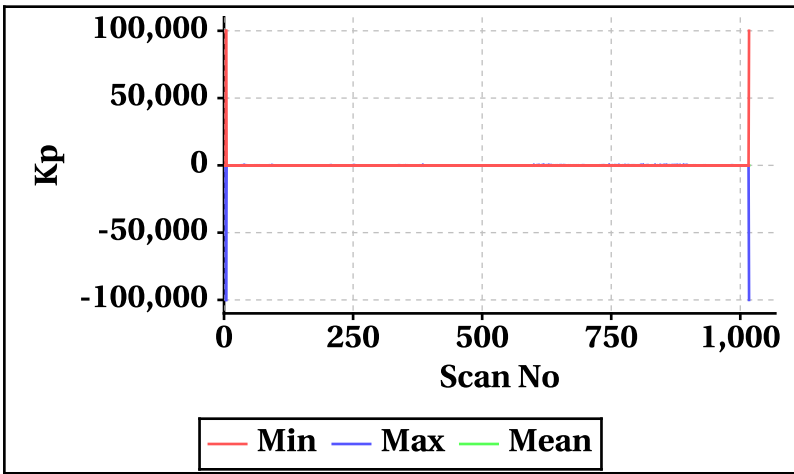


Outer Beam(VV)

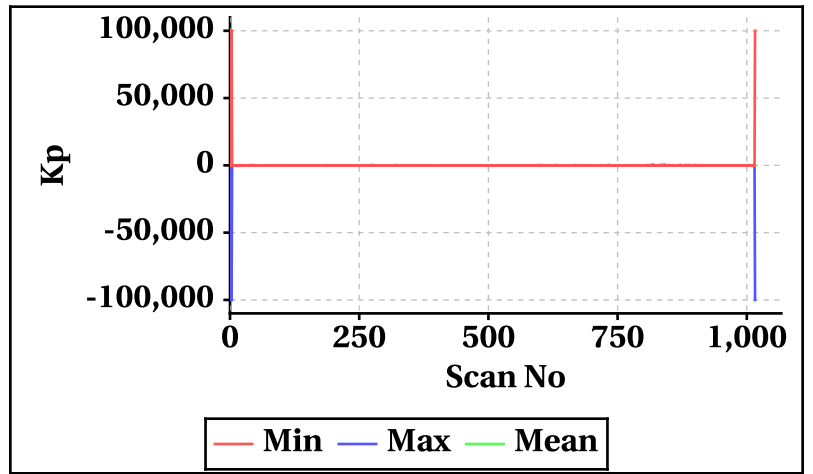


## Orbit-wise behaviour of Kp, Kpa, Kpb, Kpc

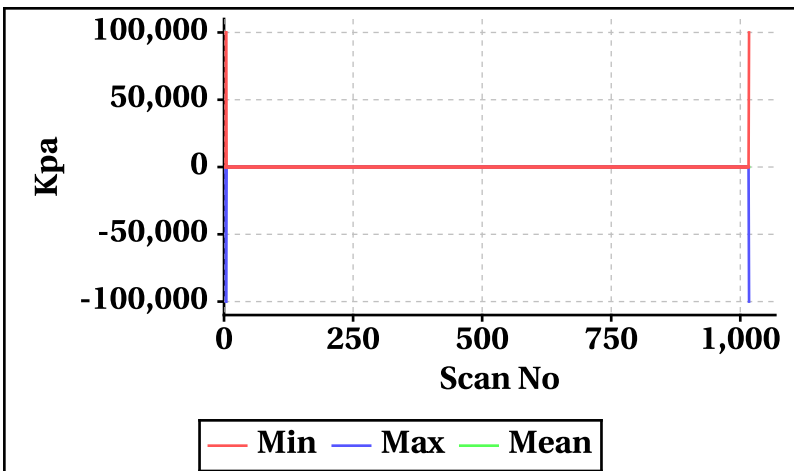
Inner Beam(HH)



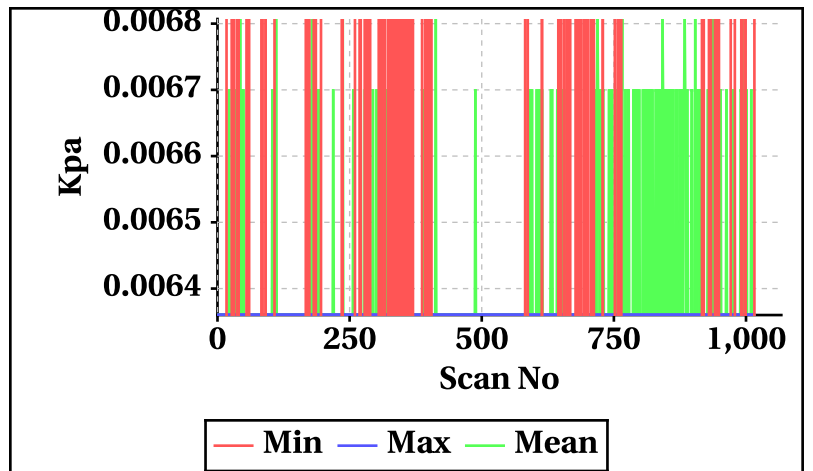
Outer Beam(VV)



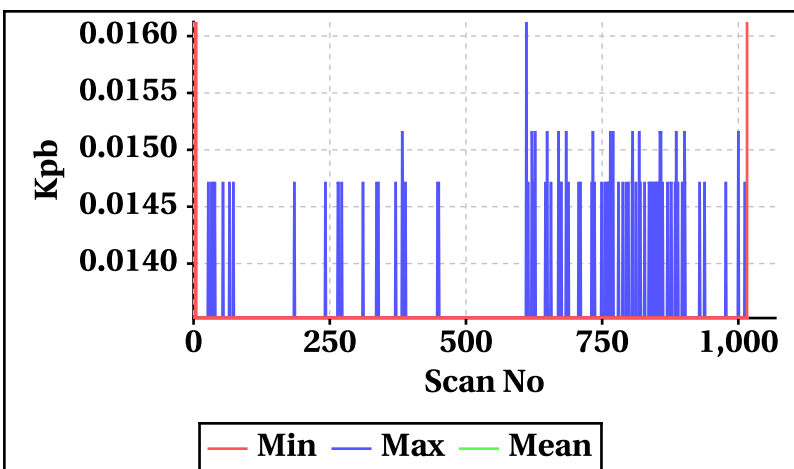
Inner Beam(HH)



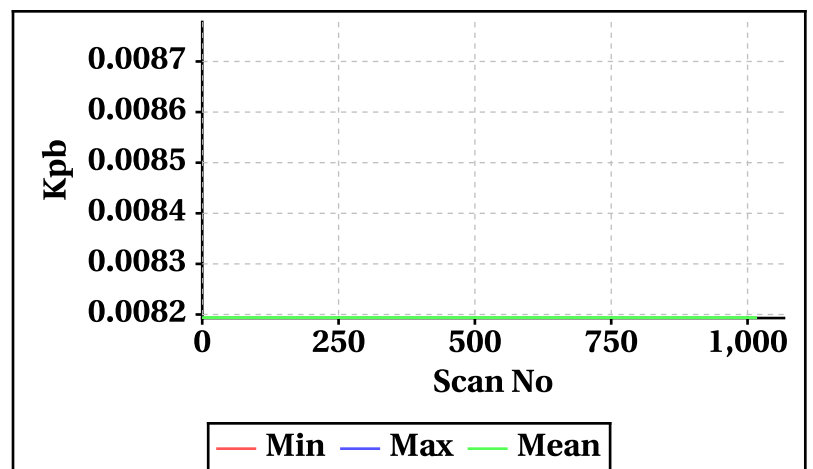
Outer Beam(VV)



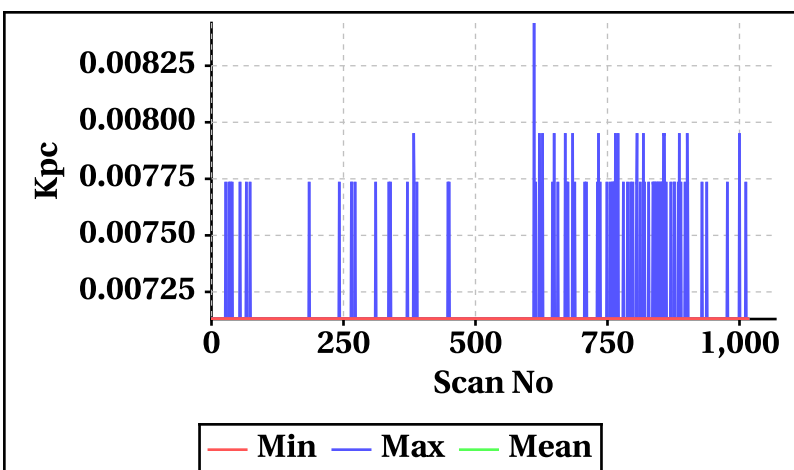
Inner Beam(HH)



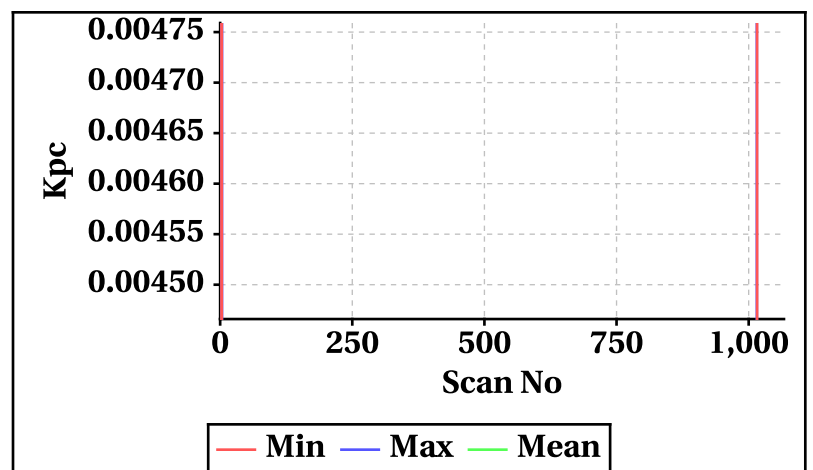
Outer Beam(VV)



Inner Beam(HH)

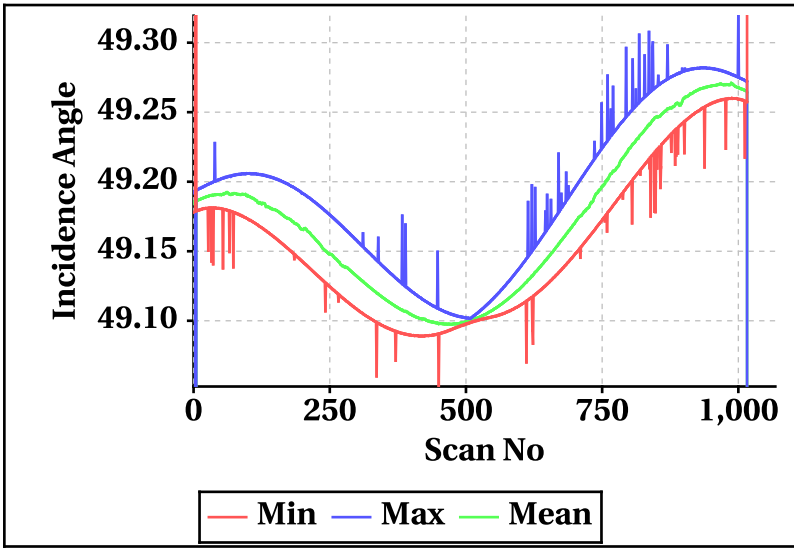


Outer Beam(VV)

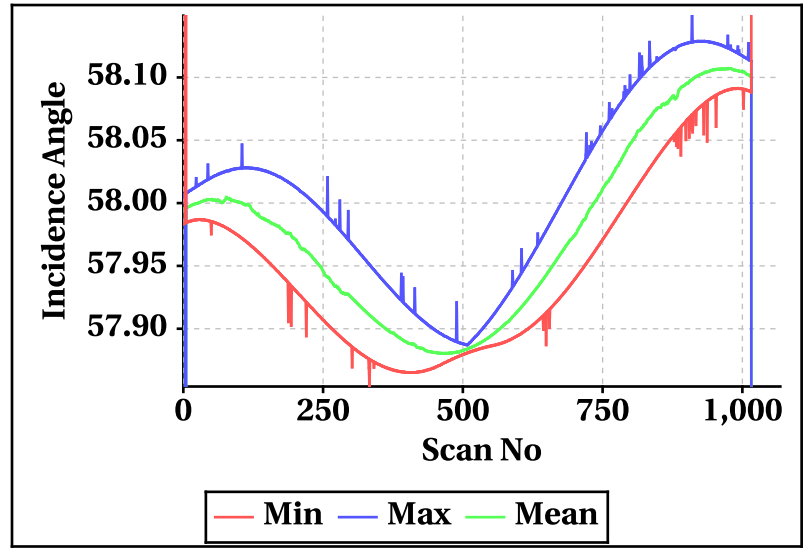


Orbt-wise behaviour of Incidence,Azimuth,Range,X-Factor

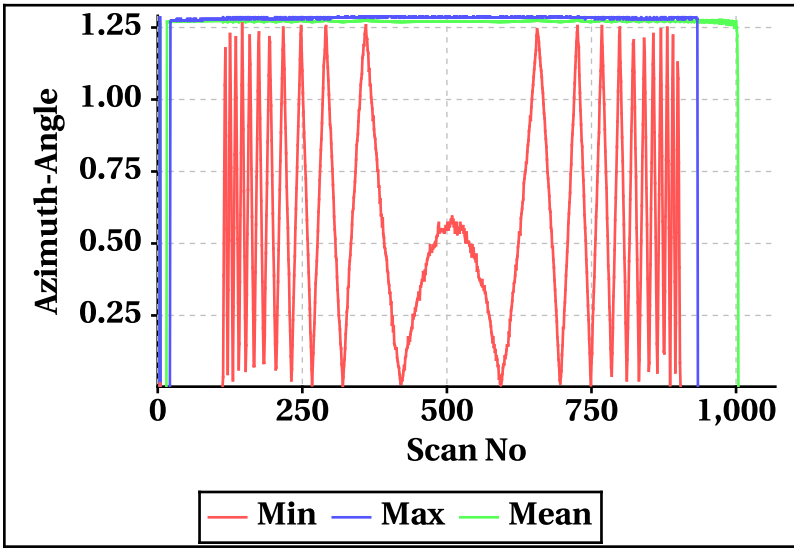
Inner Beam (HH)



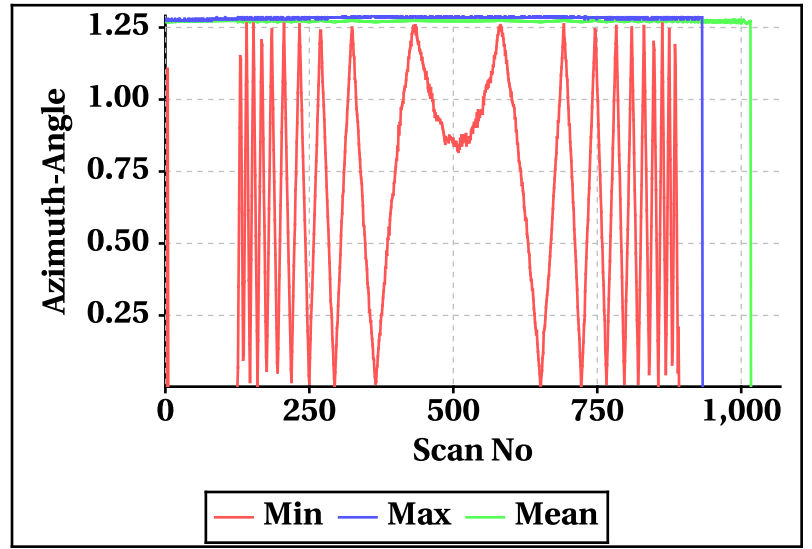
Outer Beam(VV)



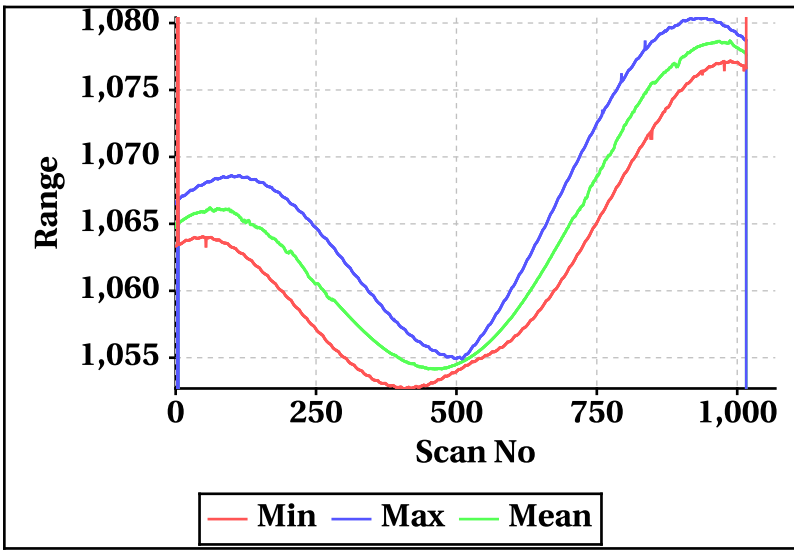
Inner Beam (HH)



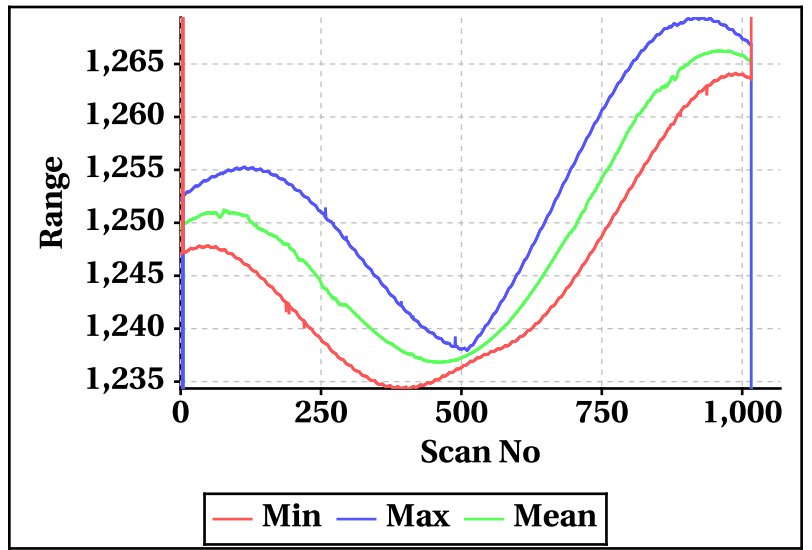
Outer Beam(VV)



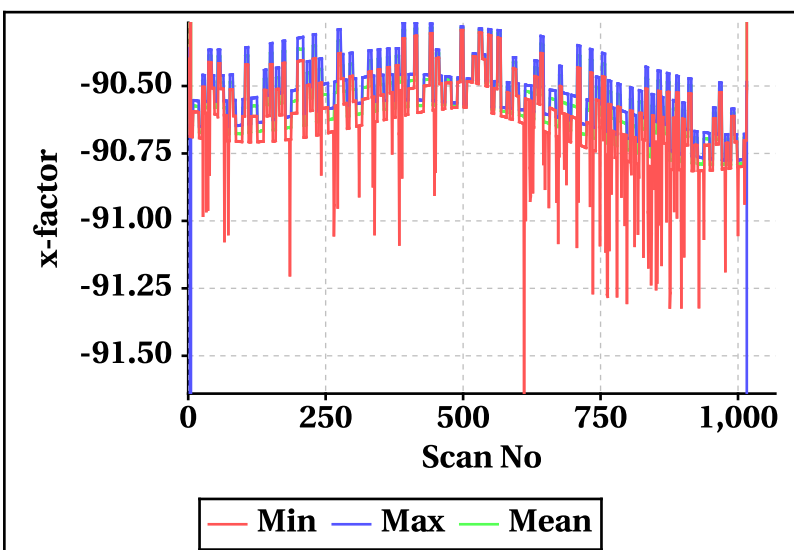
Inner Beam (HH)



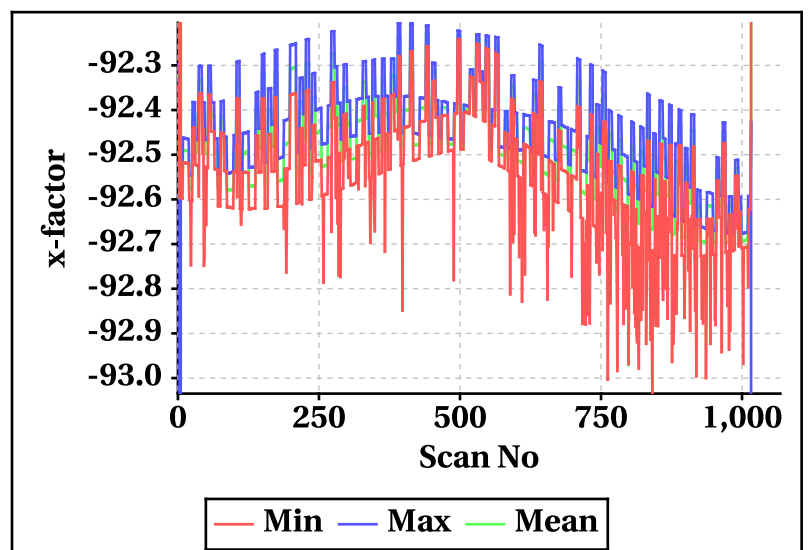
Outer Beam(VV)



Inner Beam (HH)



Outer Beam(VV)

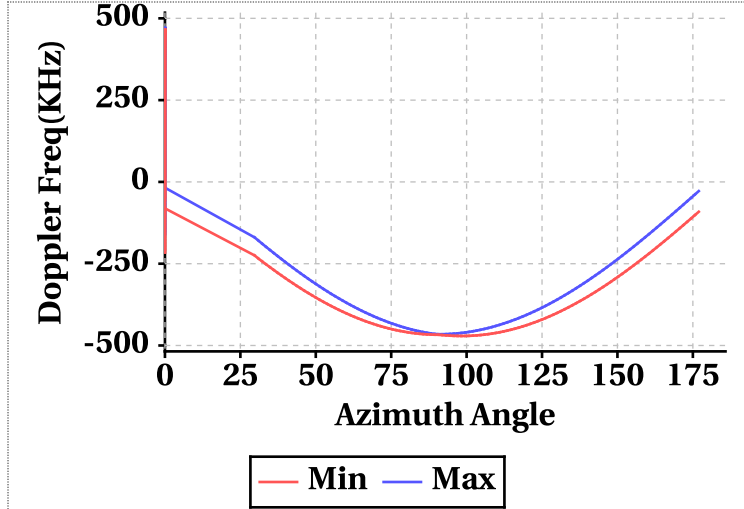


# Doppler Frequency Variation

Doppler Frequency(KHz) variation statistics Over the half Orbit

	Inner Beam (HH)	Outer Beam (VV)
Min	-470.94	-526.76
Max	470.32	526.24

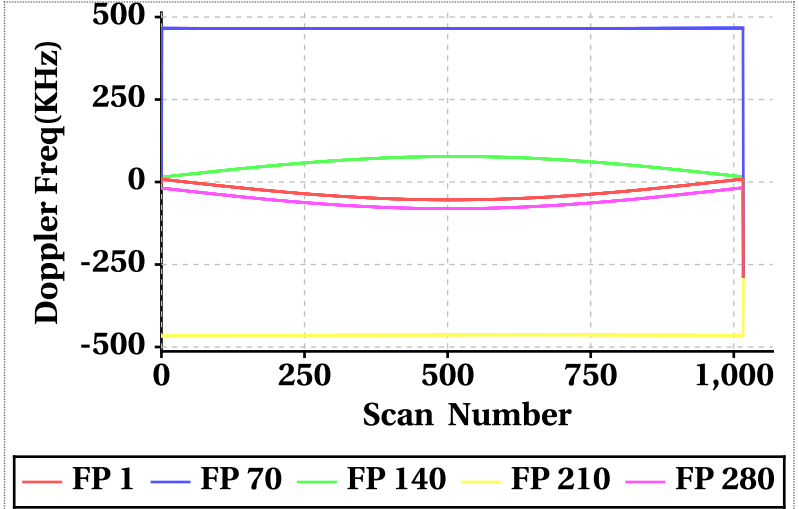
Footprint wise Doppler frequency variation Inner Beam (HH)



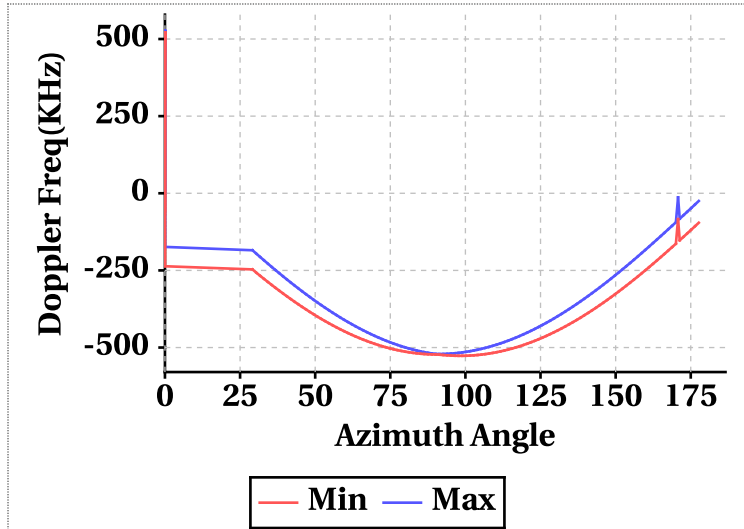
Doppler Frequency(KHz) variation

Doppler_FP	Inner Beam (HH)			Outer Beam (VV)		
	Min	Max	Mean	Min	Max	Mean
Doppler_1	-285.76	9.04	-31.47	-314.66	4.84	-40.57
Doppler_70	-285.76	466.56	464.19	-314.66	521.76	518.56
Doppler_140	-285.76	77.34	54.25	-314.66	80.16	54.02
Doppler_210	-466.68	-285.76	-464.01	-522.26	-314.66	-519.90
Doppler_280	-285.76	-17.64	-58.35	-314.66	-13.36	-58.79

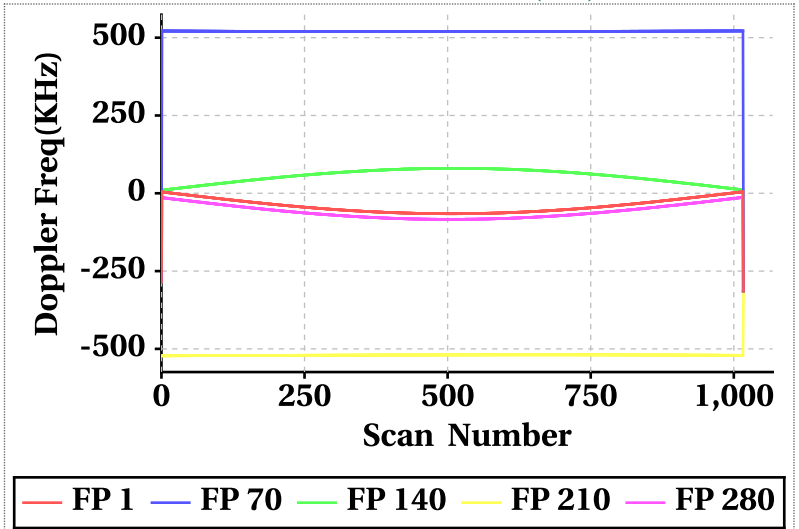
Doppler frequency variation at footprints: 1, 70, 140, 210 & 280 Inner Beam (HH)



Footprint wise Doppler frequency variation Outer Beam (VV)

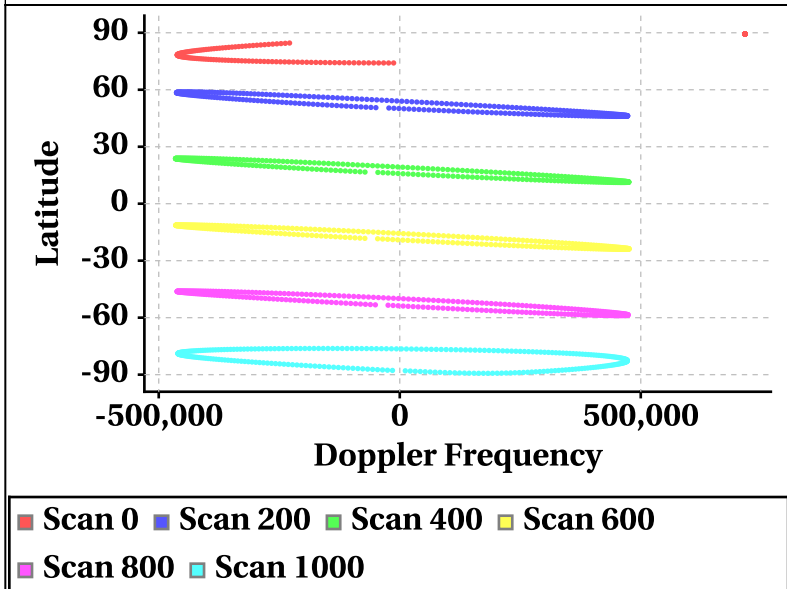


Doppler frequency variation at footprints: 1, 70, 140, 210 & 280 Outer Beam (VV)

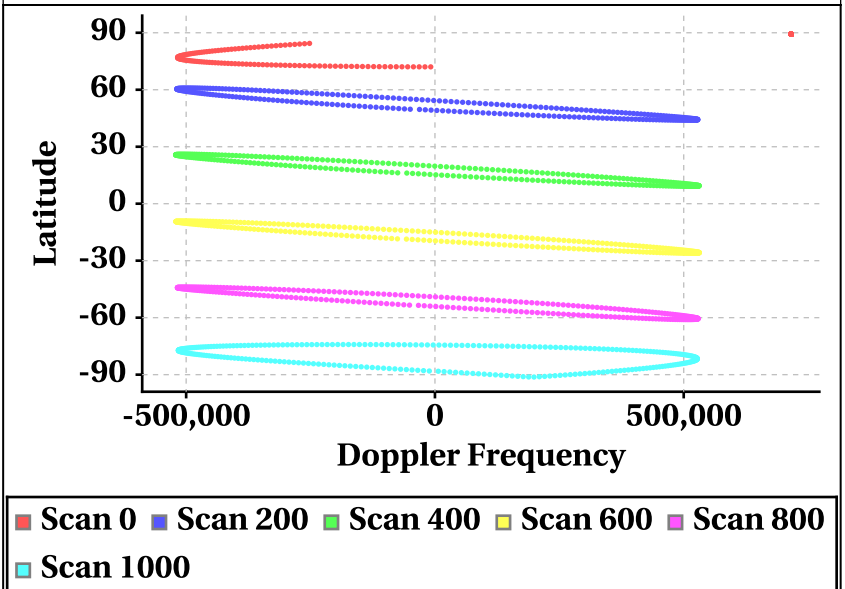


# Latitude Vs Doppler Frequency

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



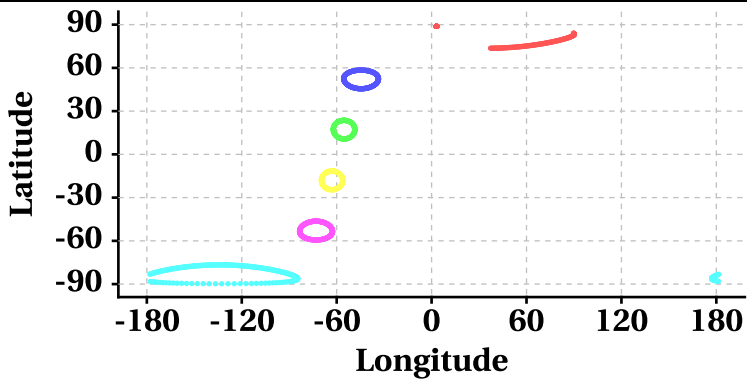
Doppler Frequency at Scan Interval of 200 [Outer Beam(VV)]



# Parameter as a function of Latitude

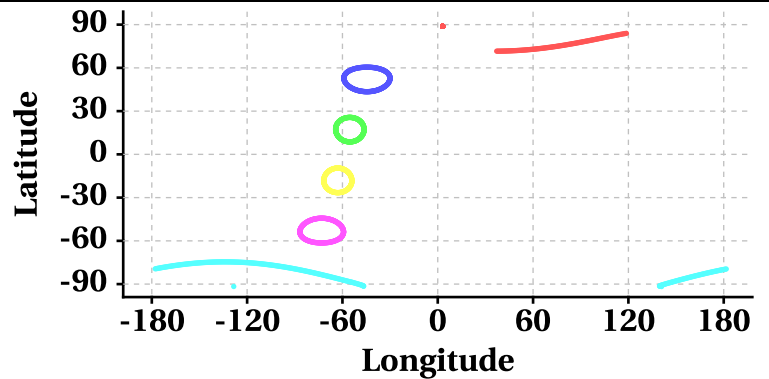
## Latitude Vs Longitude

Scan Trace [Inner Beam(HH)]



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

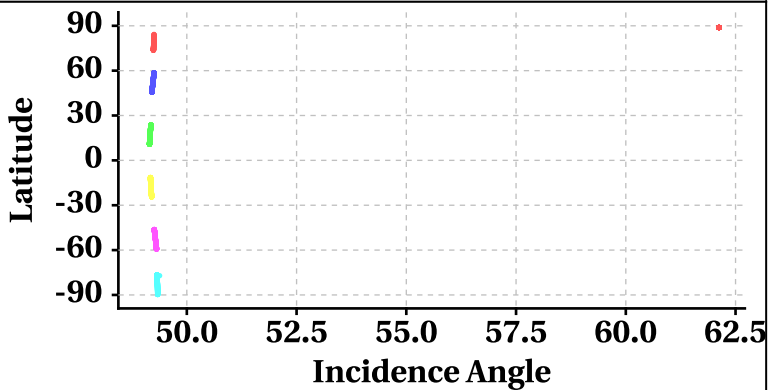
Scan Trace [Outer Beam (VV)]



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

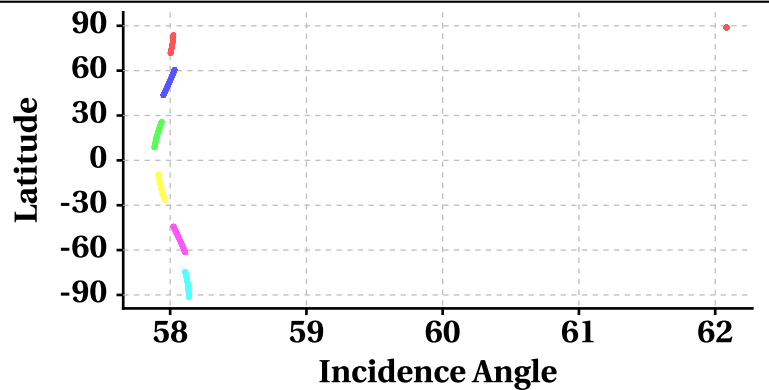
## Latitude Vs Incidence Angle

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



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

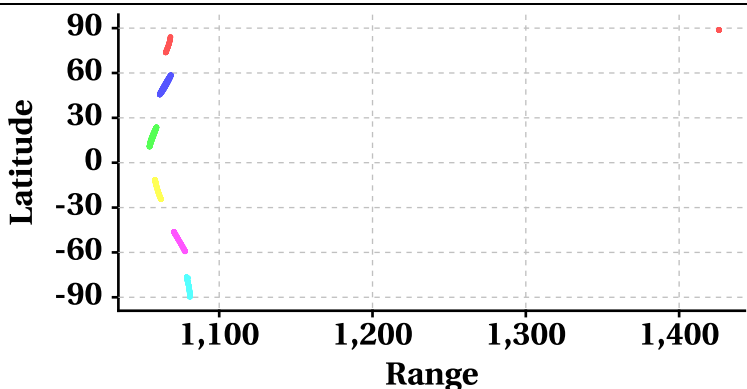
Incidence Angle at Scan Interval of 200 [Outer Beam (VV)]



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

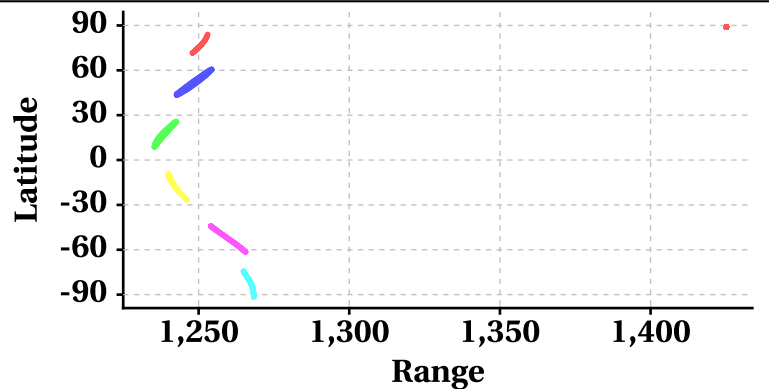
## Latitude Vs Range

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

