

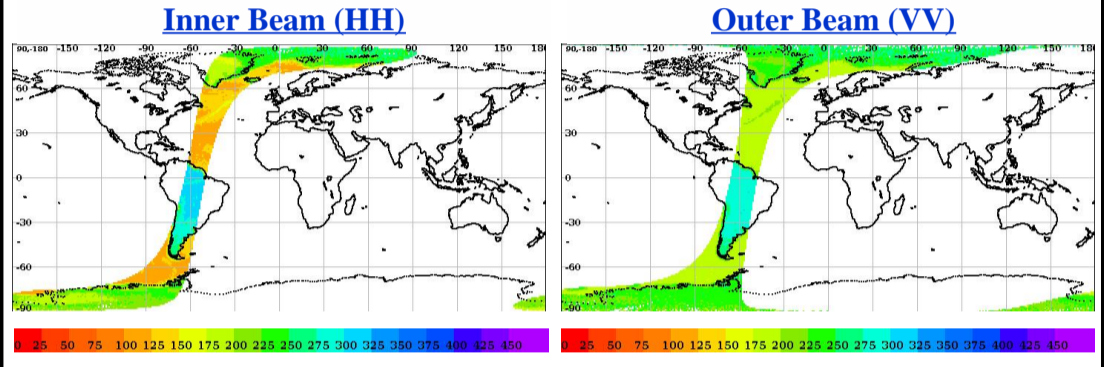
# SCATSAT-1 Scatterometer Level-1B Data Quality Evaluation Report

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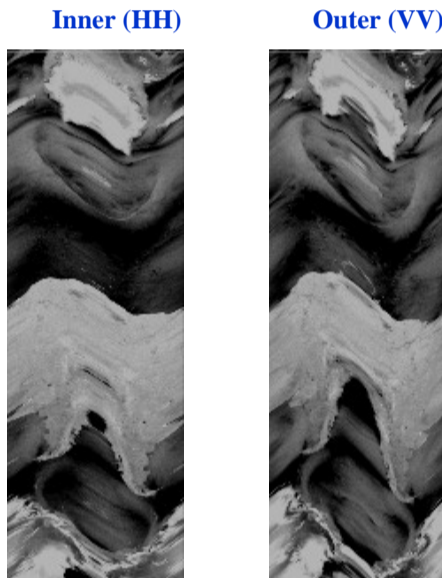
- Half-Orbit Coverage using BT & Sigma-0
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<b>Satellite Id</b>	ScatSat-1	<b>Start Orbit</b>	18013	<b>Total Scans</b>	1016
<b>Sensor Name</b>	Scatterometer	<b>End Orbit</b>	18014	<b>No of Inner FootPrints</b>	281
<b>Processor Version</b>	v1.1.4	<b>Rev. Number</b>	18013_18014	<b>No Of Outer FootPrints</b>	282
<b>Half Orbit Direction</b>	NS	<b>Data Production Date</b>	20-02-2020	<b>No. Of Inner Slices</b>	9
<b>Equator Crossing Date</b>	20-02-2020	<b>Equator Crossing Time</b>	12:07:13.000	<b>No Of Outer Slices</b>	15

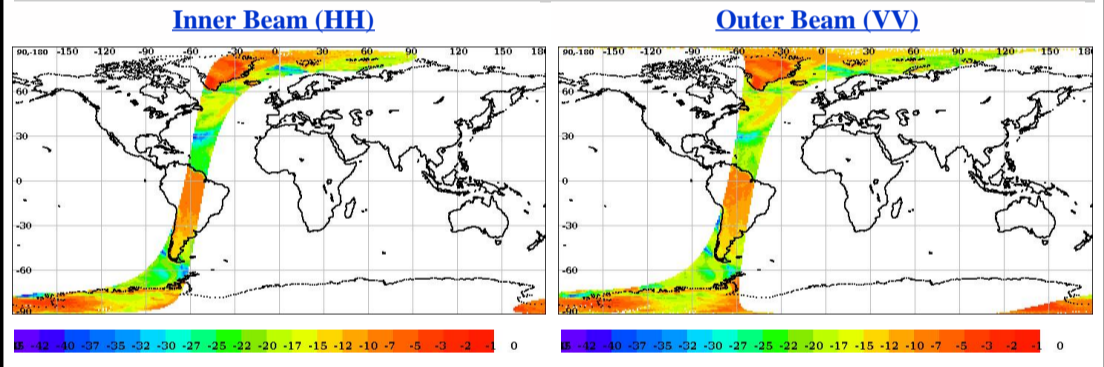
## Brightness Temperature(k) Footprint trace



## Image Snapshot for Inner & Outer Beam



## Sigma0(dB) Footprint trace



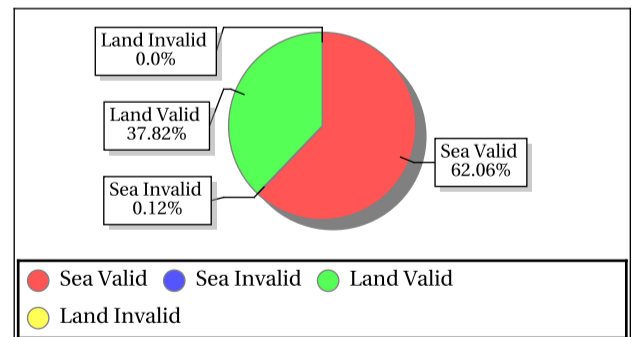
## Invalid and Poor Sigma-0 Quality Flag Statistics for Inner/Outer Slices\*

Sigma-0 Flags	Inner Beam	Outer Beam
Invalid Sigma0(%)	0.12	0.12
Data Not Available From Payload (%)	100.0	99.97980
Slice not within sample array limits (%)	0.00	0.02
C(S+N) - C(N) < 0.1 (%)	0.00	0.00
Poor Sigma0(%)	22.20	13.32
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 (%)	0.011571	0.030219

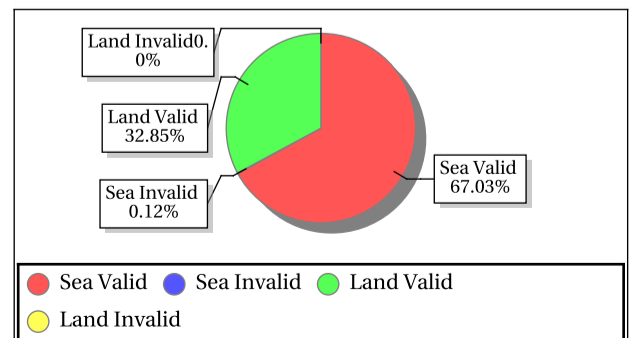
\*DP Format Document

## 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	DSC	Aft	-6.30	-4.33	-5.29	0.61	152.27	205.37	175.83	13.19
GreenLand_2	77.50	-41.50	Inner	DSC	Fore	-6.30	-4.28	-5.41	0.62	158.21	220.25	186.30	16.70
GreenLand_3	71.55	-42.45	Inner	DSC	Aft	-11.19	-8.36	-9.63	0.68	164.29	215.29	184.83	13.07
GreenLand_3	71.55	-42.45	Inner	DSC	Fore	-10.00	-7.51	-8.99	0.70	167.71	214.56	198.01	10.63
Amazon_3	-6.00	-61.00	Inner	DSC	Aft	-9.58	-6.89	-8.12	0.55	279.61	341.80	307.58	15.95
Amazon_3	-6.00	-61.00	Inner	DSC	Fore	-9.50	-6.82	-8.30	0.59	261.10	341.41	308.90	20.28
GreenLand_1	74.69	-42.50	Inner	DSC	Aft	-10.10	-7.81	-9.04	0.66	168.82	222.69	187.97	14.46
GreenLand_1	74.69	-42.50	Inner	DSC	Fore	-10.77	-7.58	-9.28	0.88	162.45	209.62	190.64	12.69
Amazon_2	-3.00	-61.00	Inner	DSC	Aft	-12.58	-6.83	-9.13	1.32	236.25	334.59	288.75	24.81
Amazon_2	-3.00	-61.00	Inner	DSC	Fore	-11.31	-7.32	-8.77	0.93	241.70	335.25	290.57	20.01
GreenLand_2	77.50	-41.50	Outer	DSC	Aft	-5.05	-4.42	-4.67	0.23	210.13	231.52	221.54	8.38
GreenLand_2	77.50	-41.50	Outer	DSC	Fore	-6.11	-4.73	-5.25	0.52	195.97	243.16	217.83	18.71
GreenLand_3	71.55	-42.45	Outer	DSC	Aft	-12.30	-10.05	-11.19	0.69	219.73	258.90	237.43	9.90
GreenLand_3	71.55	-42.45	Outer	DSC	Fore	-11.35	-9.83	-10.71	0.43	209.74	261.51	234.00	13.36
Amazon_3	-6.00	-61.00	Outer	DSC	Aft	-10.56	-8.66	-9.50	0.45	246.88	326.14	291.20	19.50
Amazon_3	-6.00	-61.00	Outer	DSC	Fore	-10.56	-8.66	-9.48	0.49	259.08	331.31	289.36	16.29
GreenLand_1	74.69	-42.50	Outer	DSC	Aft	-9.76	-7.79	-8.58	0.66	202.70	257.85	226.38	14.19
GreenLand_1	74.69	-42.50	Outer	DSC	Fore	-10.23	-7.99	-9.11	0.56	224.08	261.49	243.09	12.86
Amazon_2	-3.00	-61.00	Outer	DSC	Aft	-12.70	-8.62	-10.32	1.06	237.50	317.65	286.71	19.49
Amazon_2	-3.00	-61.00	Outer	DSC	Fore	-11.83	-8.07	-9.92	0.82	260.91	320.77	282.35	13.46



## 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>	0.12	300.79	0.18	0.627	0.12	270.38	0.17	0.562	0.12	0.21	0.12	0.000	0.12	0.18	0.12	0.000
<b>Kpa</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>Kpb</b>	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
<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	24.30	8.60	0.005	-34.45	22.57	8.42	0.010	-0.57	28.61	19.21	12.952	1.16	30.01	19.95	22.029

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>	0.09	221.45	0.18	0.952	0.09	234.25	0.17	0.823	0.09	0.15	0.09	0.000	0.09	0.17	0.09	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>	0.01	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>	-34.76	19.60	5.94	0.000	-35.00	19.78	5.68	0.000	0.20	22.60	13.82	0.039	-1.27	23.28	14.10	0.325

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)				Parameter Specifications		
	Min	Max	Mean	Bad Occ. (%)	Min	Max	Mean	Bad Occ. (%)	Parameter	Min	Max
<b>Incidence Angle (deg)</b>	48.72	49.33	49.02	0.000	57.53	58.16	57.90	0.000	Inci.(Inner)	47.10	49.90
<b>Azimuth Diff. (deg)</b>	0.0026	265.11	1.28	2.597	0.0000	293.91	1.27	3.799	Inci.(Outer)	57.30	58.90
<b>Range(Km)</b>	1038.58	1074.08	1054.05	0.000	1217.33	1261.32	1234.51	0.000	Azimuth Diff.	0.60	2.00
<b>X Factor(dbm)</b>	-91.25	-89.71	-90.19	0.000	-92.73	-91.75	-92.04	0.000	Range(Inner)	1025.00	1095.70
<b>Across Distance (Km)</b>	15.84	16.38	16.01	0.000	9.84	35.91	21.04	4.000	Range(Outer)	1210.00	1280.00
<b>Along Distance (Km)</b>	18.87	1429.58	21.12	1.000	18.66	1883.30	21.48	1.000	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

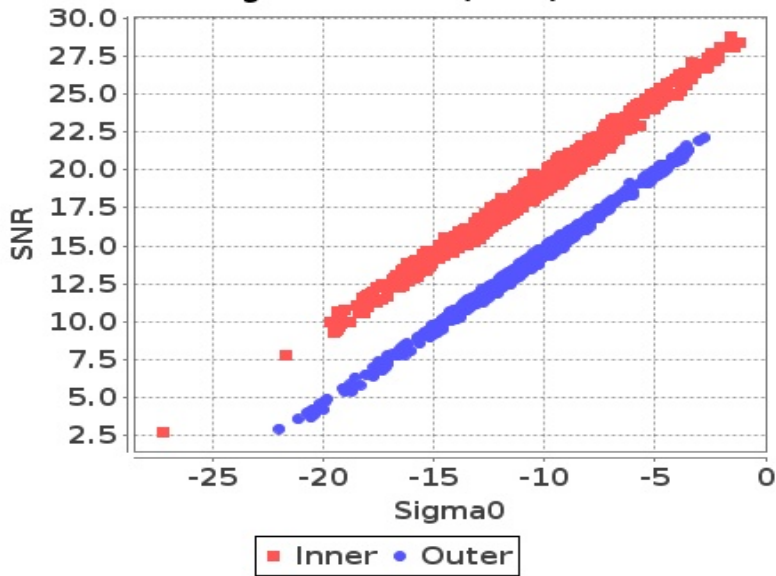
- Normal
- Deviations
- Alarming
- High Errors



## Sigma0 Behaviour (Sigma0 Vs SNR)

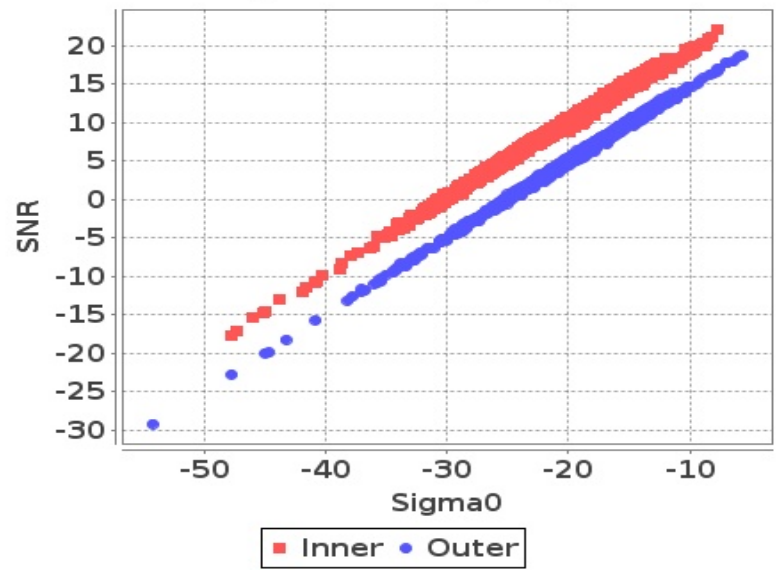
Footprint-Land

Sigma0 Vs SNR (Land)



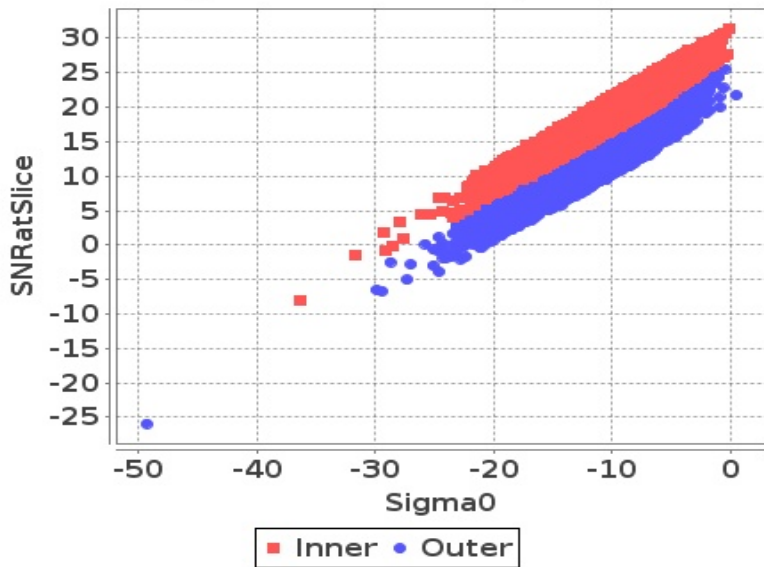
Footprint-Sea

Sigma0 Vs SNR (Sea)



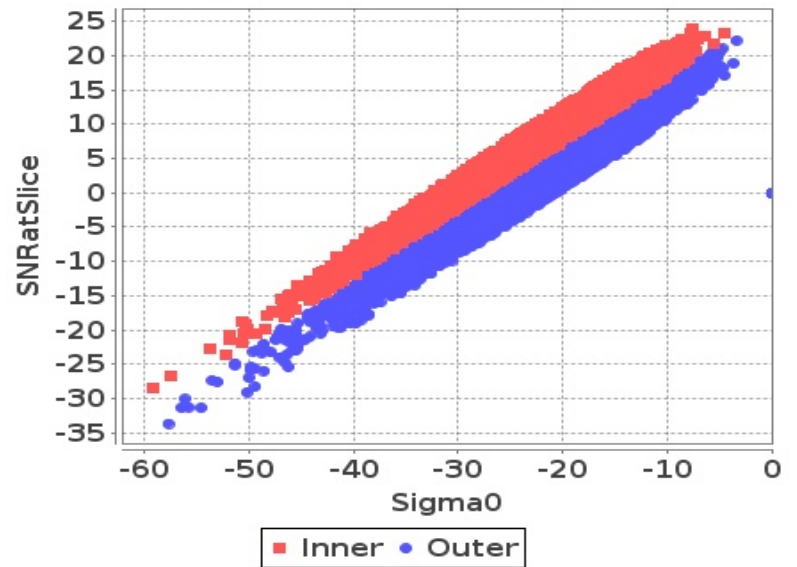
Slice-Land

Sigma0 Vs SNRatSlice (Land)



Slice-Sea

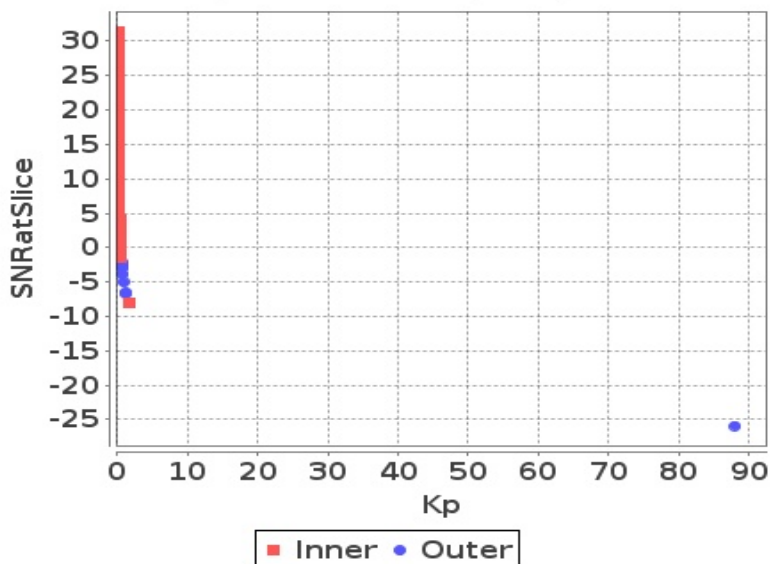
Sigma0 Vs SNRatSlice (Sea)



## Sigma0 Behaviour (Kp Vs SNR)

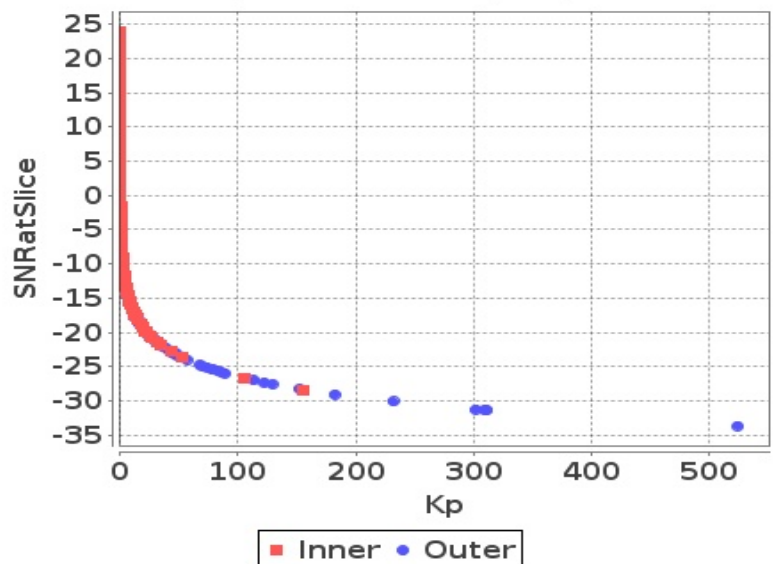
Slice

Kp Vs SNRatSlice (Land)



Slice

Kp Vs SNRatSlice (Sea)

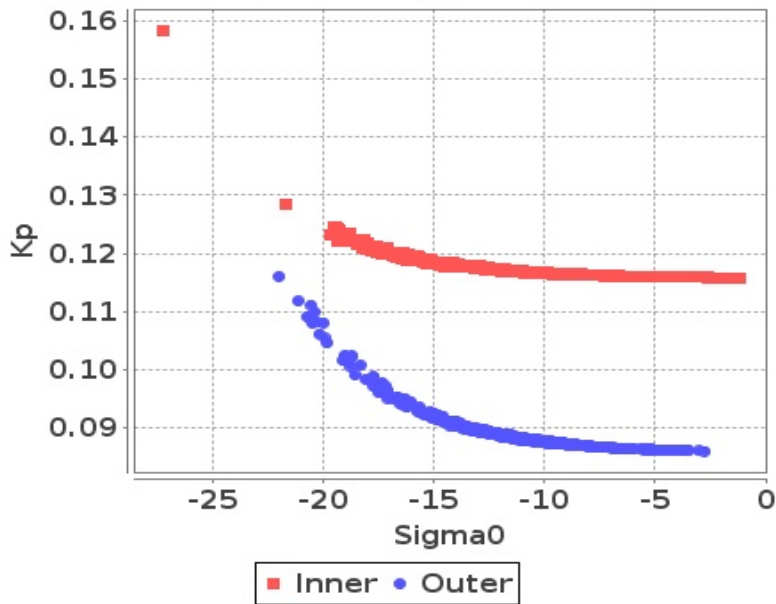




# Sigma0 Behaviour(Sigma0 Vs Kp)

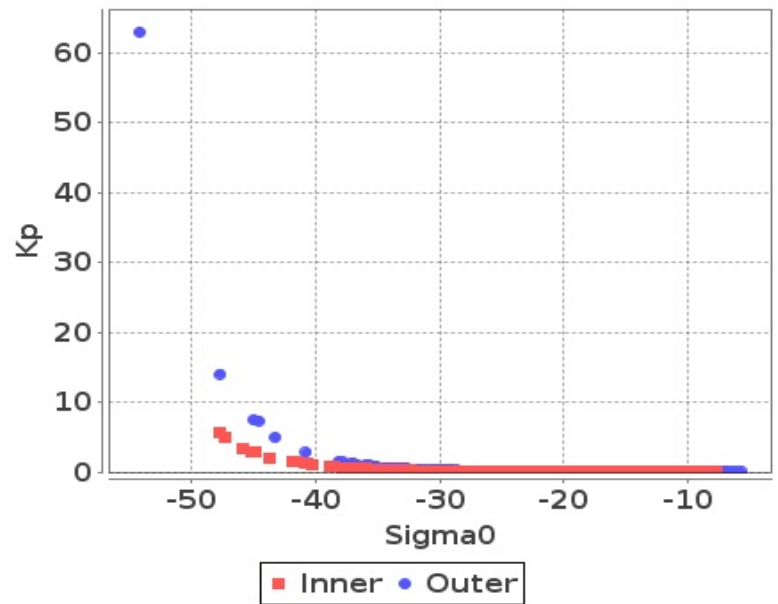
## Footprint-Land

### Sigma0 Vs Kp (Land)



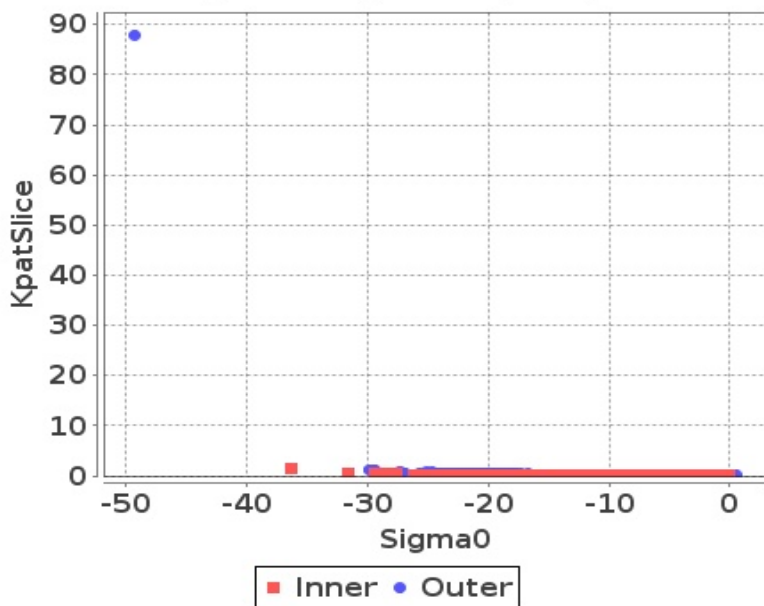
## Footprint-Sea

### Sigma0 Vs Kp (Sea)



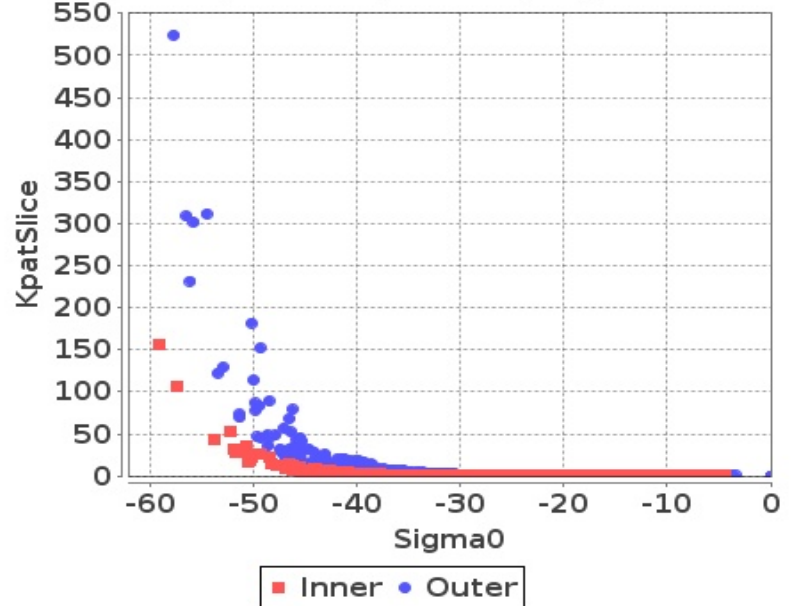
## Slice-Land

### Sigma0 Vs KpatSlice (Land)



## Slice-Sea

### Sigma0 Vs KpatSlice (Sea)

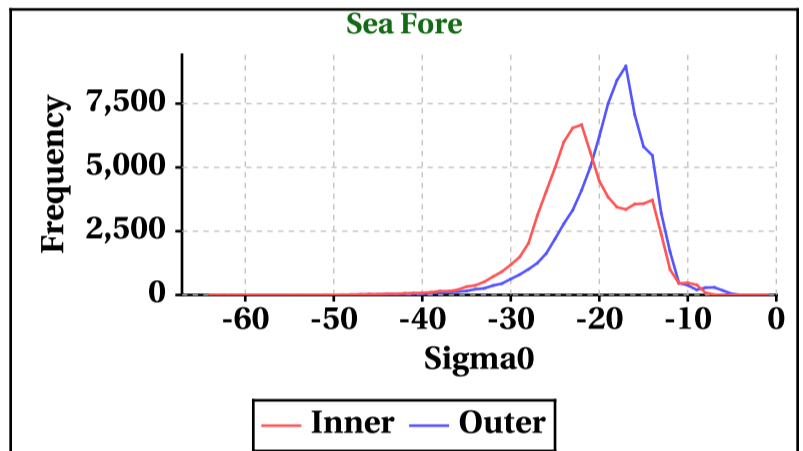
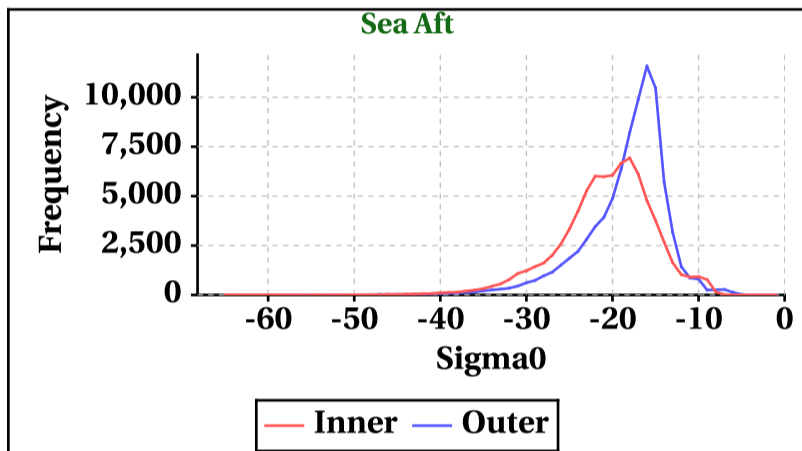
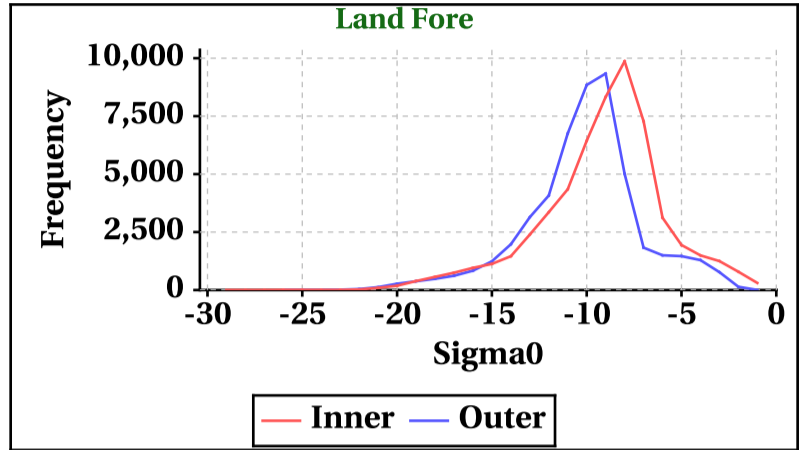
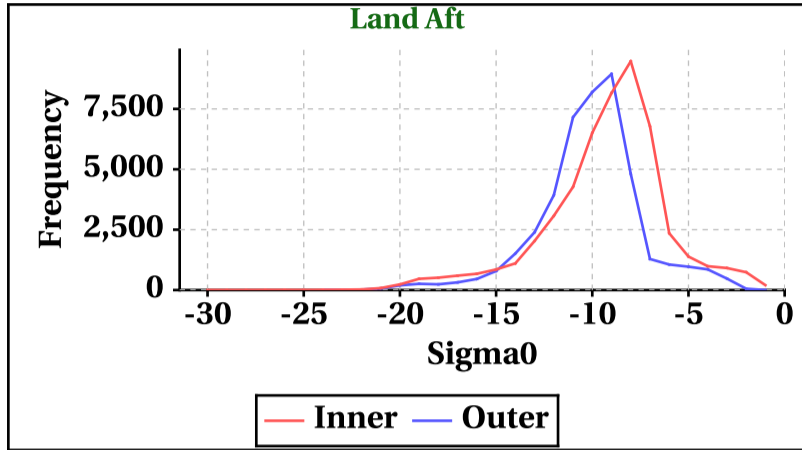


# Dynamic Range (Data Histograms)

## Sigma0(db)

Inner Beam (HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-30	-29	-65	-64
Max	0	0	0	0

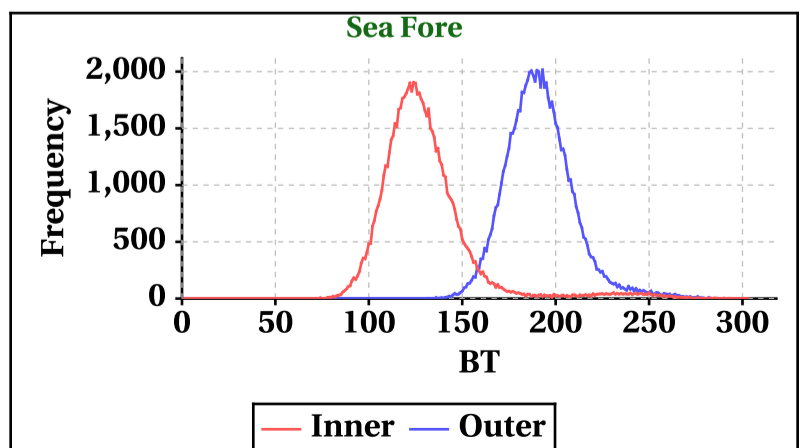
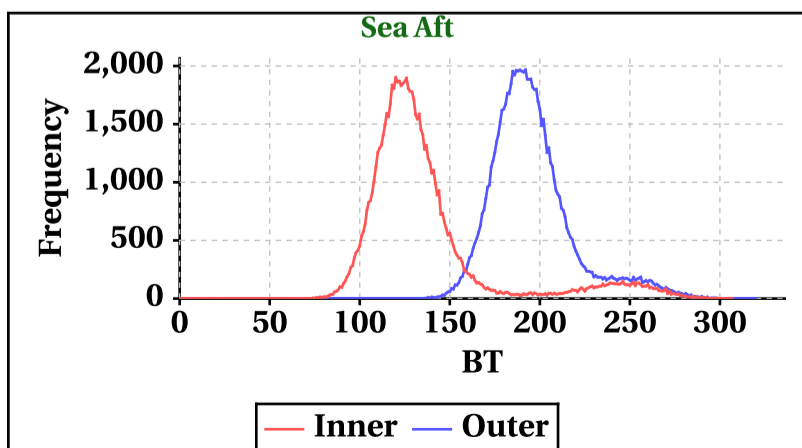
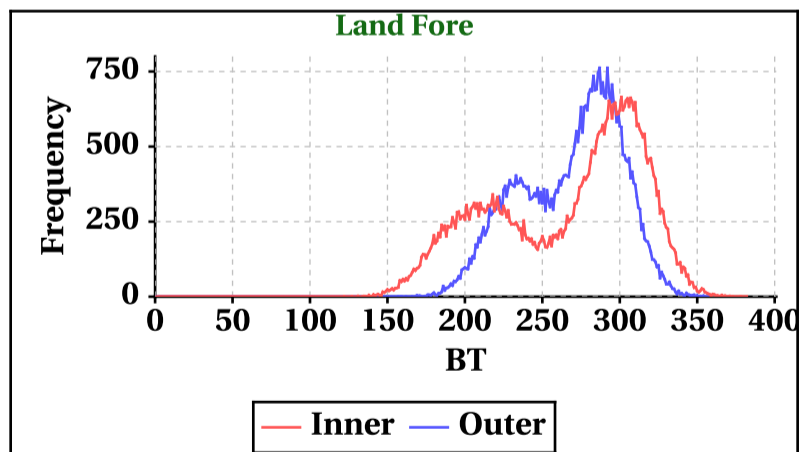
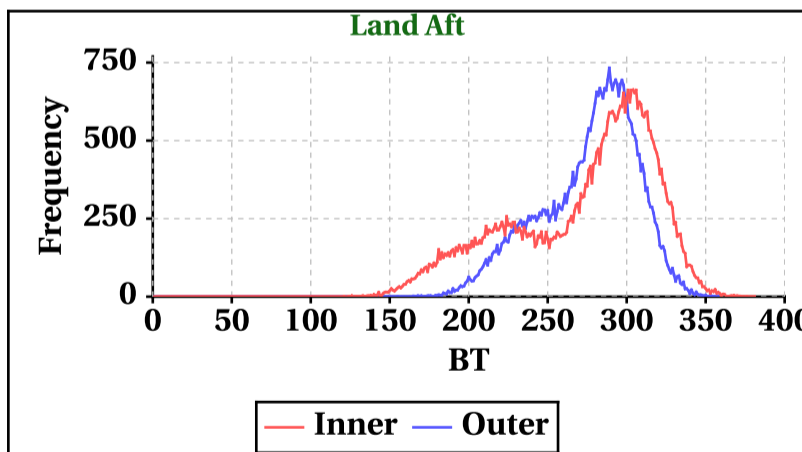
Outer Beam (VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-24	-26	-59	-60
Max	0	0	0	0



## Brightness Temperature(K)

Inner Beam(HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	0	0
Max	381	382	307	303

Outer Beam(VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	0	0
Max	358	358	320	301

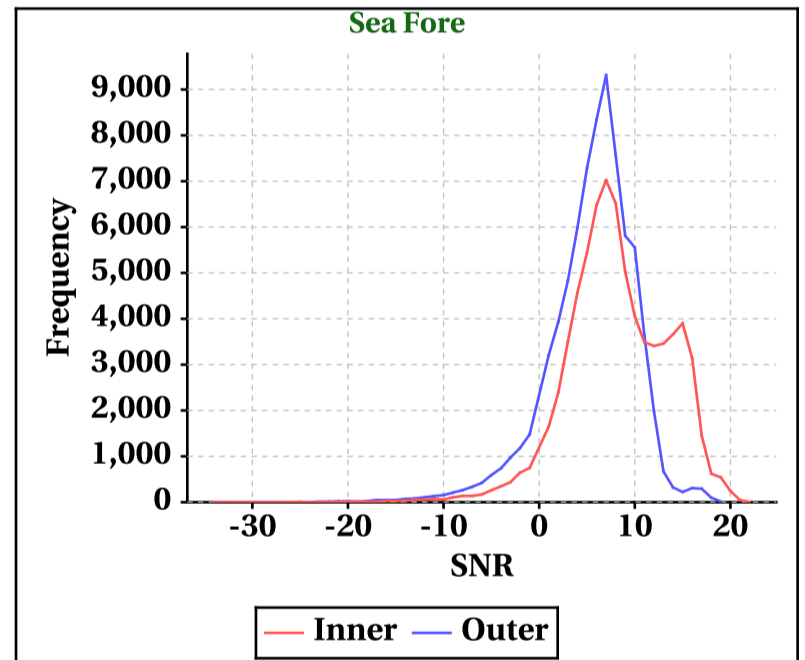
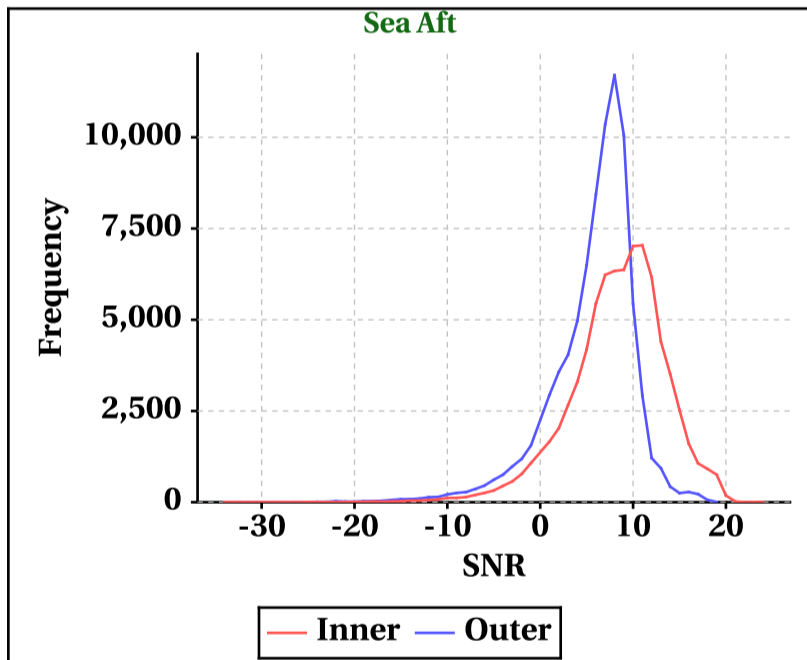
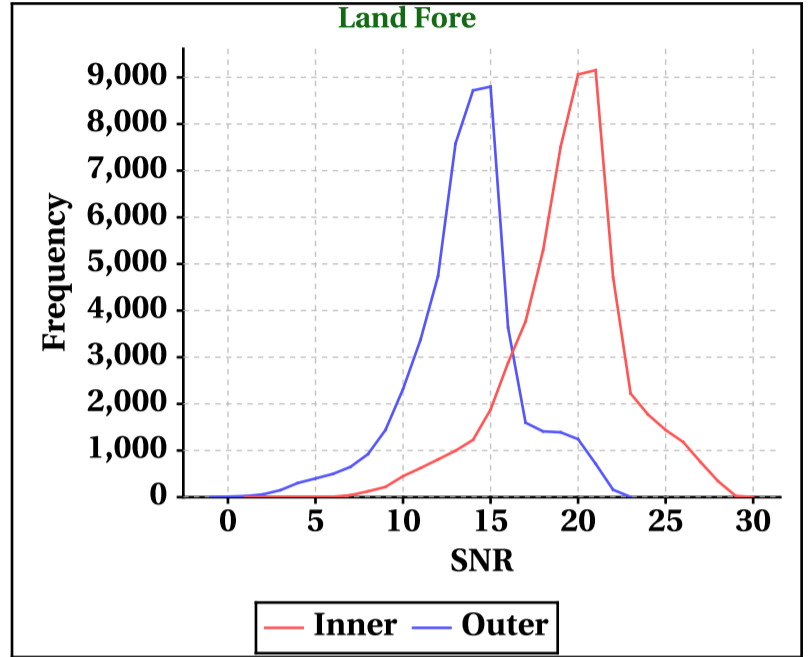
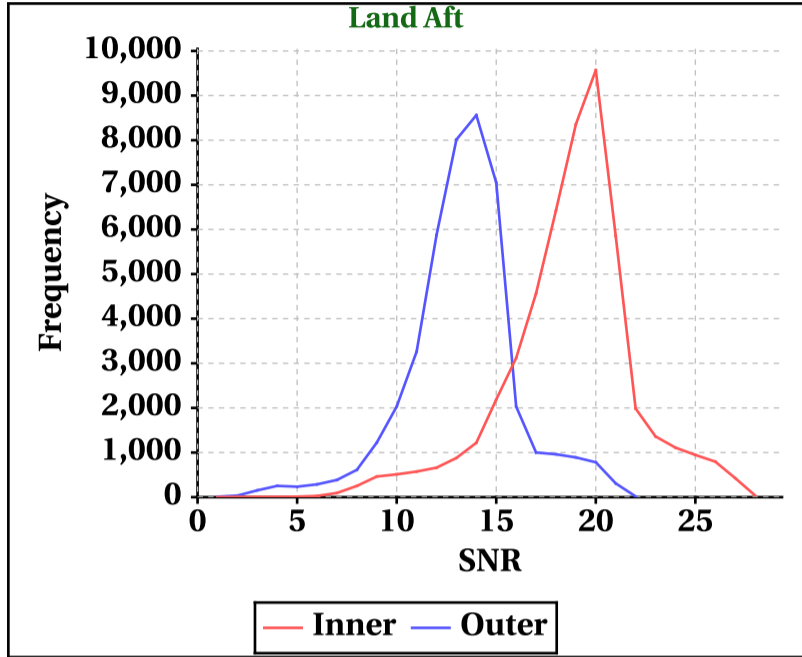


# Dynamic Range (Data Histograms)

## SNR(dBm)

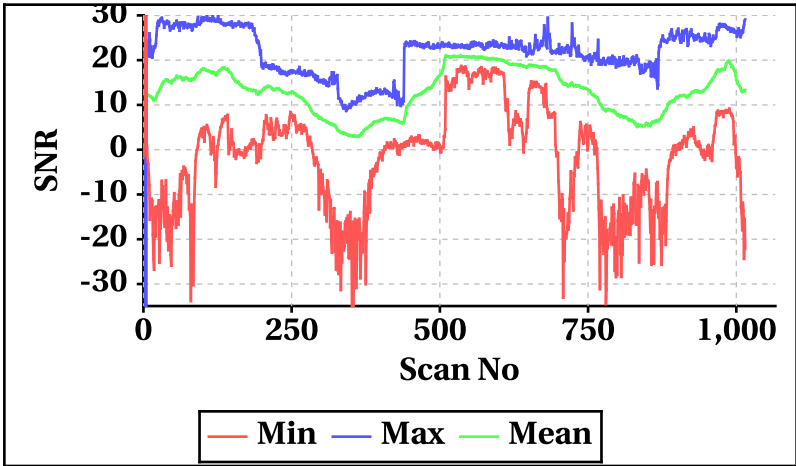
Inner Beam (HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	-34	-34
Max	28	30	24	22

Outer Beam (VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	-1	-34	-34
Max	22	23	19	19

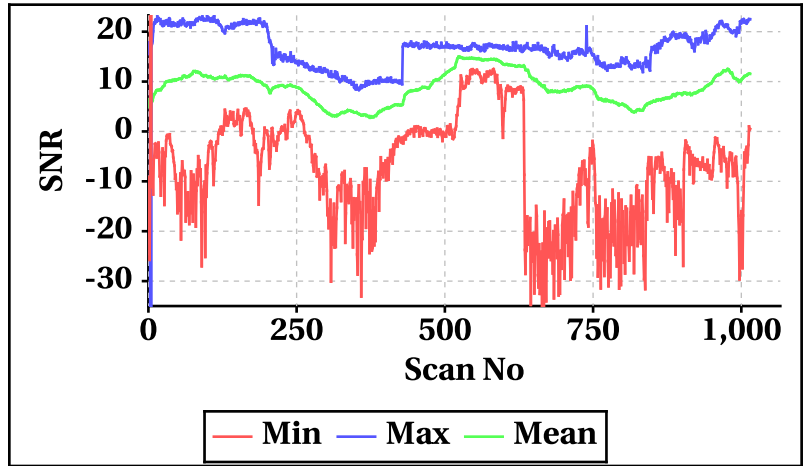


## Orbit-wise behaviour of SNR

Inner Beam (HH)

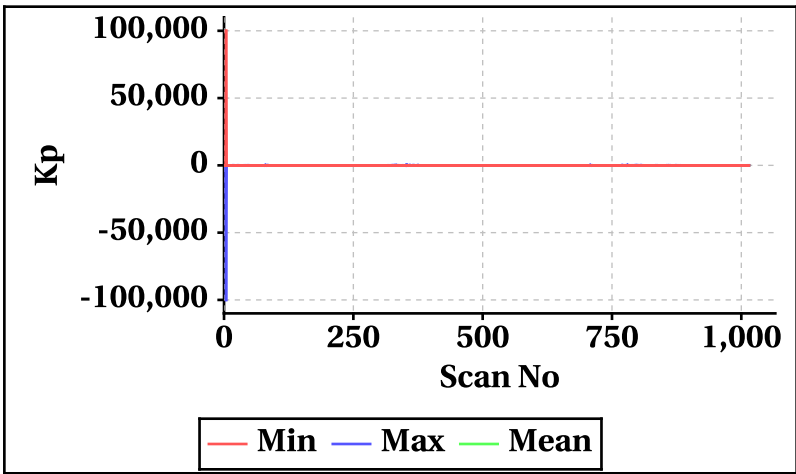


Outer Beam(VV)

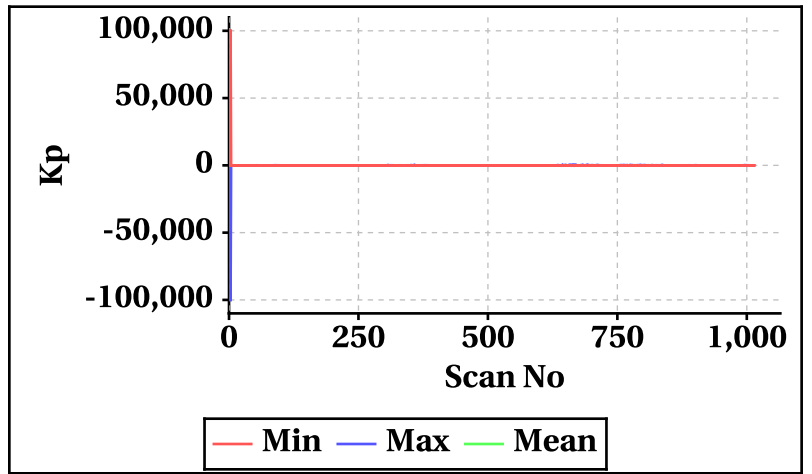


## Orbit-wise behaviour of Kp,Kpa,Kpb,Kpc

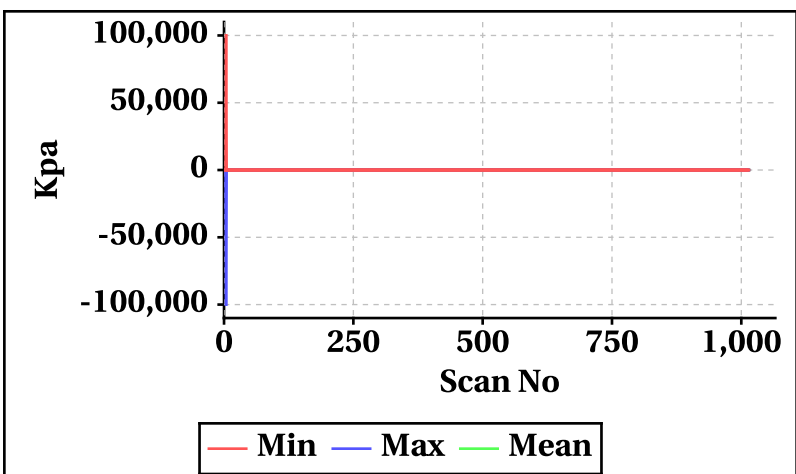
Inner Beam(HH)



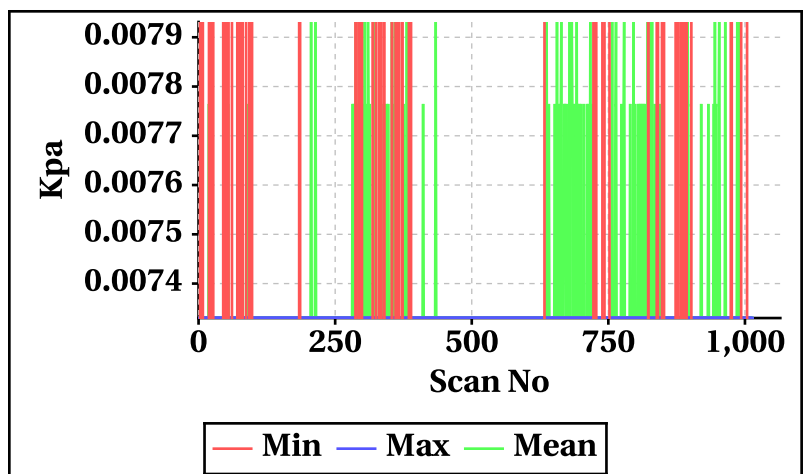
Outer Beam(VV)



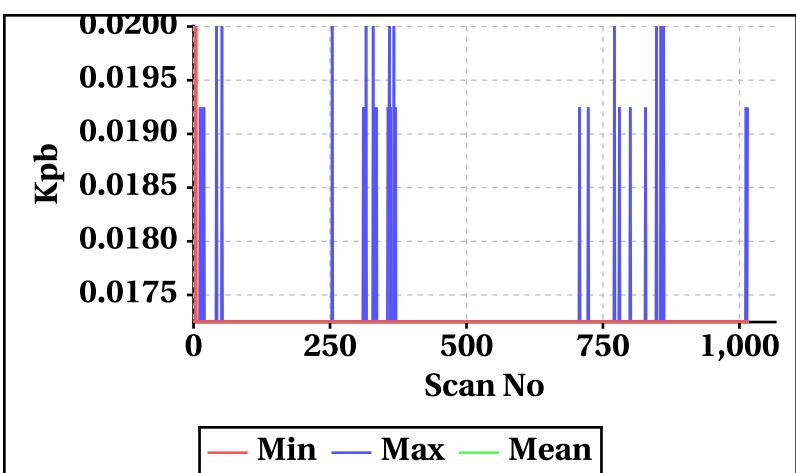
Inner Beam(HH)



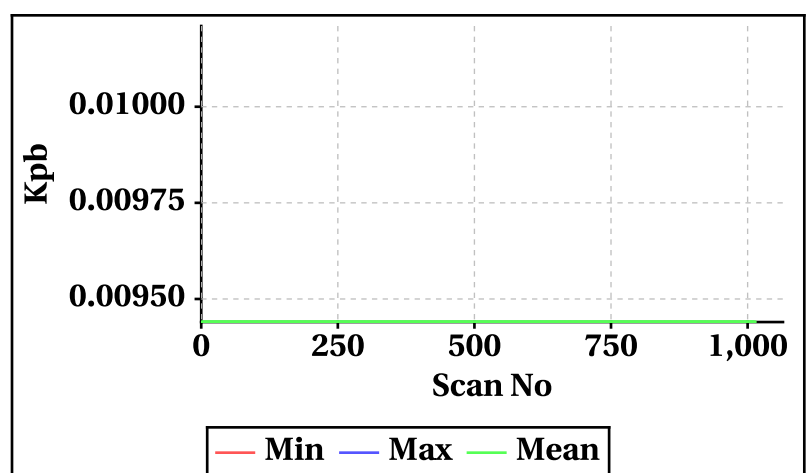
Outer Beam(VV)



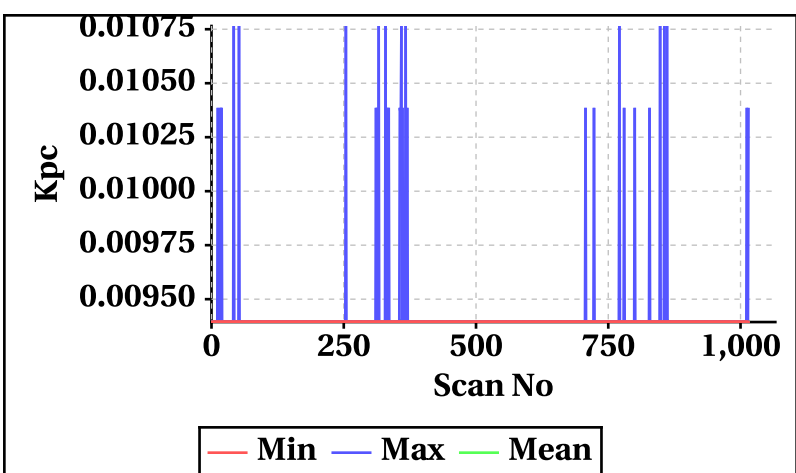
Inner Beam(HH)



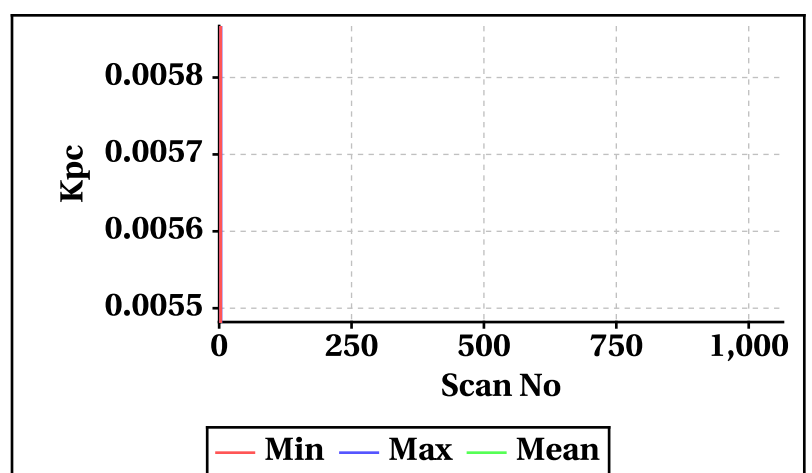
Outer Beam(VV)



Inner Beam(HH)



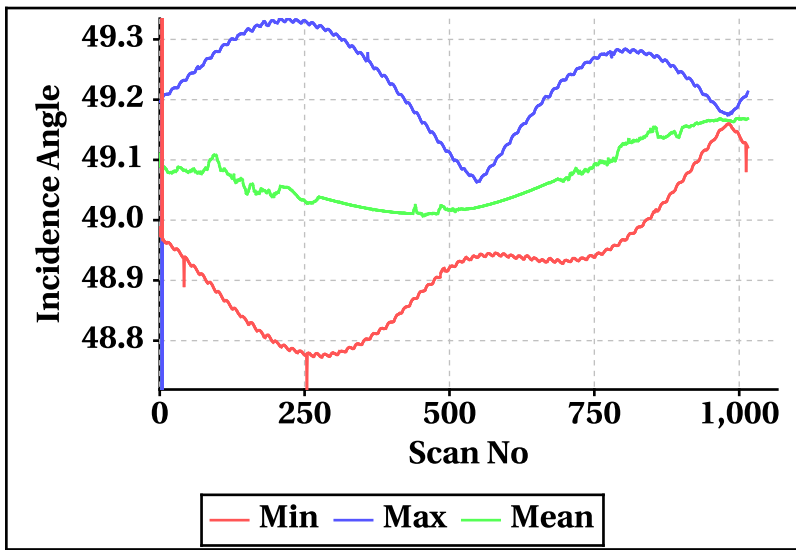
Outer Beam(VV)



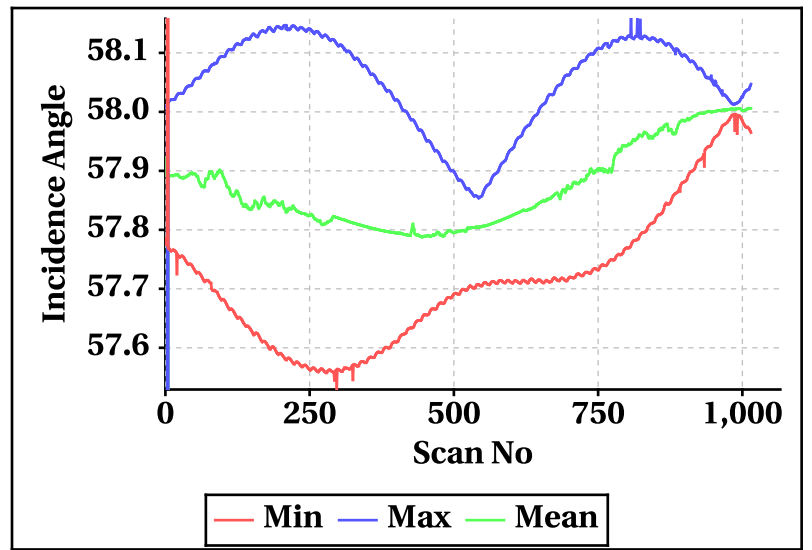


Orbit-wise behaviour of Incidence, Azimuth, Range, X-Factor

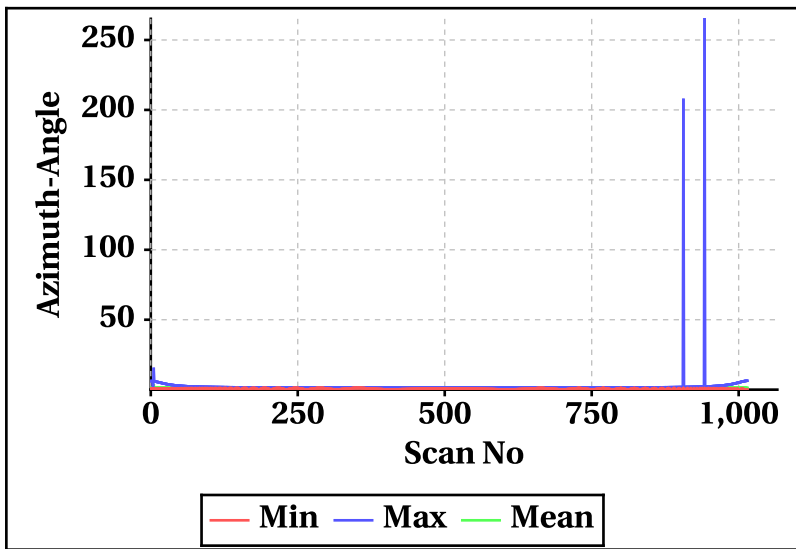
Inner Beam (HH)



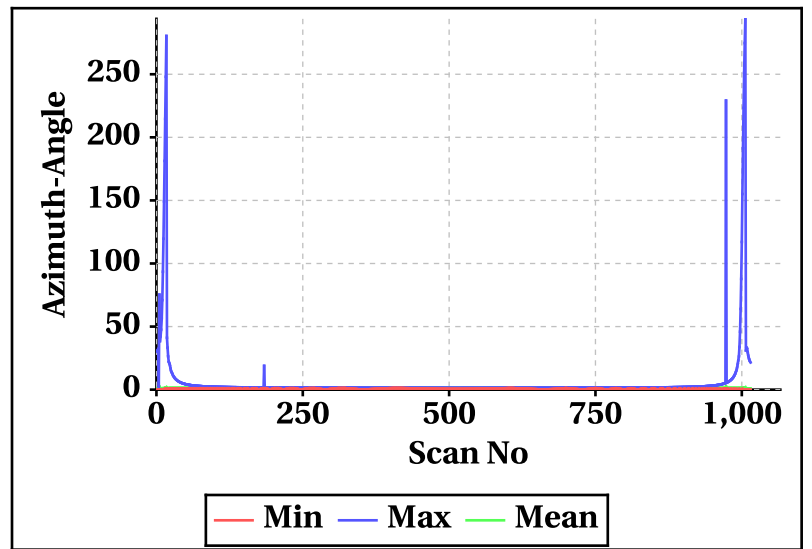
Outer Beam(VV)



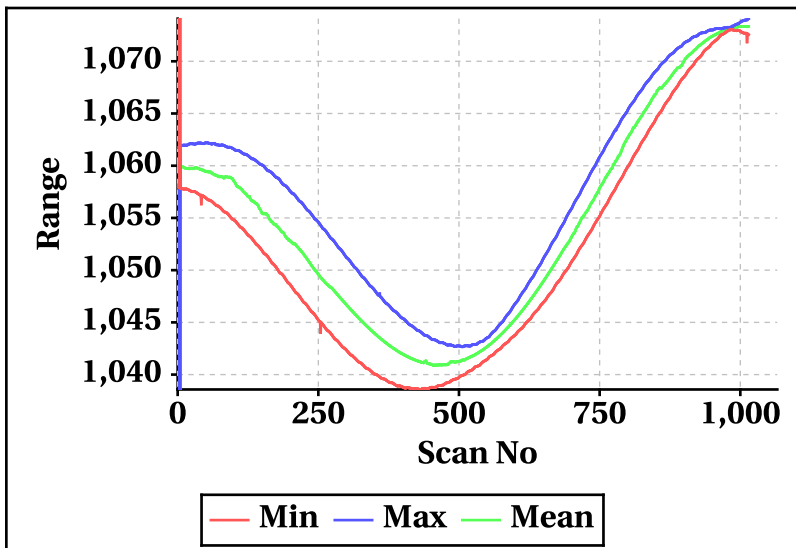
Inner Beam (HH)



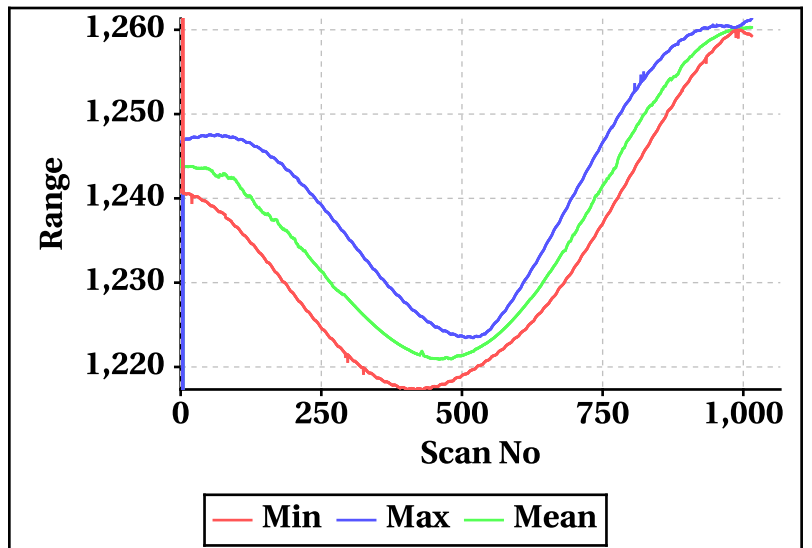
Outer Beam(VV)



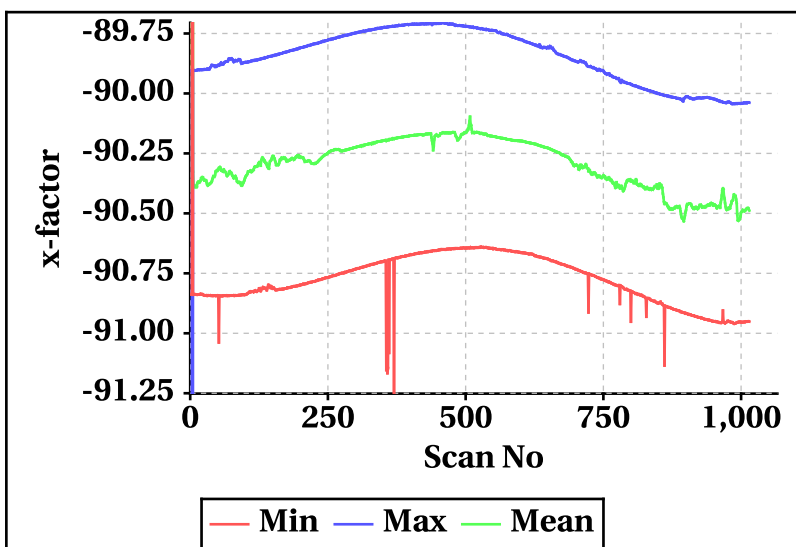
Inner Beam (HH)



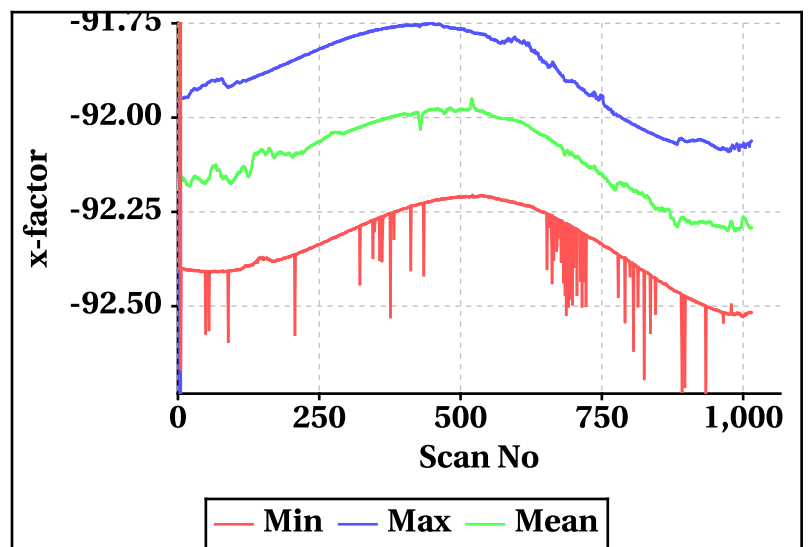
Outer Beam(VV)



Inner Beam (HH)



Outer Beam(VV)

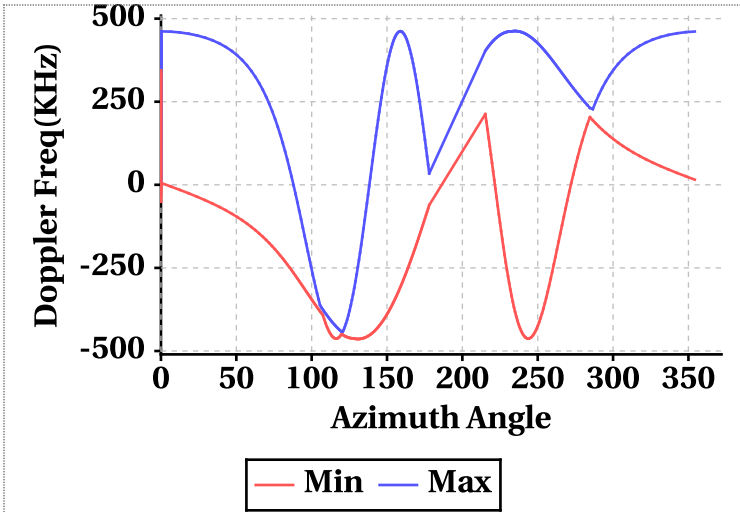


# Doppler Frequency Variation

Doppler Frequency(KHz) variation statistics Over the half Orbit

	Inner Beam (HH)	Outer Beam (VV)
Min	-463.86	-519.68
Max	462.62	518.56

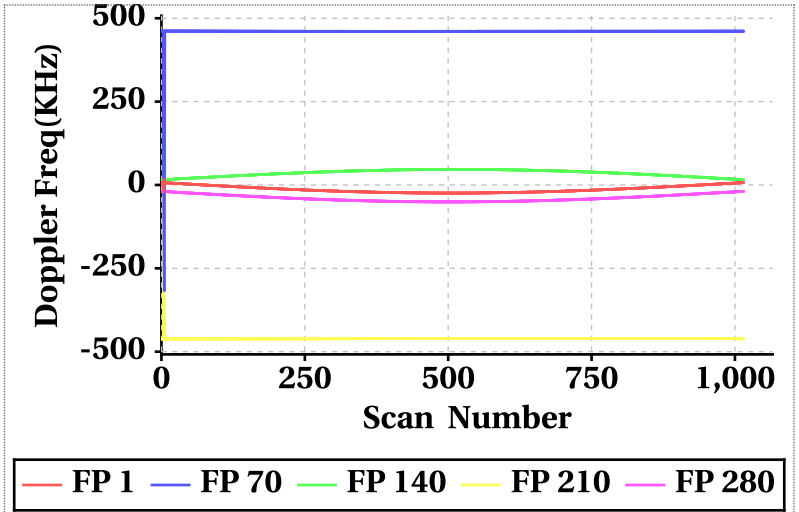
Footprint wise Doppler frequency variation Inner Beam (HH)



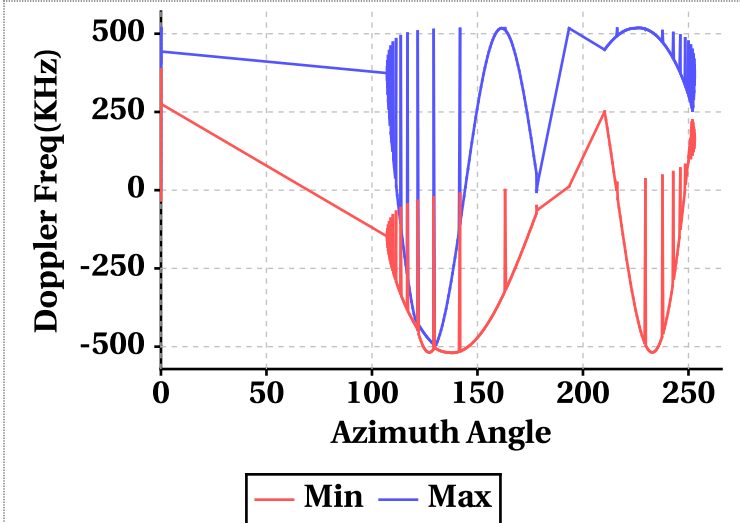
Doppler Frequency(KHz) variation

Doppler_FP	Inner Beam (HH)			Outer Beam (VV)		
	Min	Max	Mean	Min	Max	Mean
Doppler_1	-24.32	15.60	-12.85	-32.76	3.20	-19.95
Doppler_70	-315.66	461.56	459.71	-343.00	517.24	514.95
Doppler_140	-19.62	461.20	35.75	-16.04	517.46	34.34
Doppler_210	-461.90	-19.62	-460.34	-517.82	-16.04	-516.29
Doppler_280	-50.82	8.48	-39.23	-50.98	-4.96	-38.02

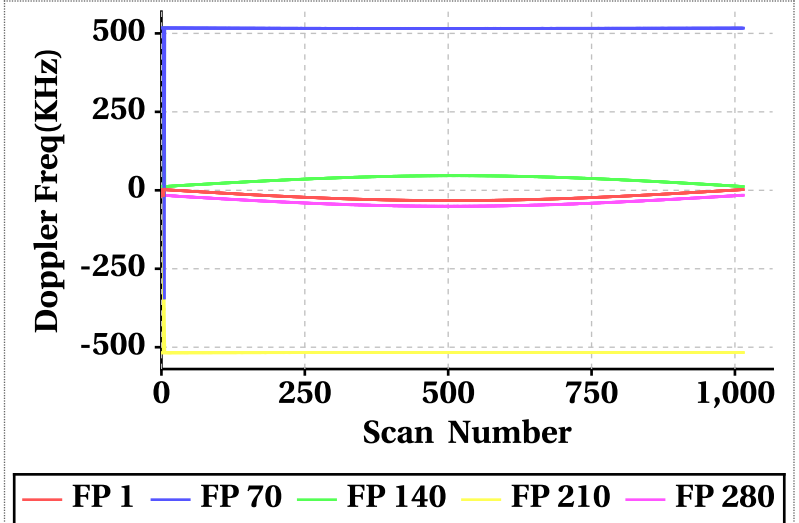
Doppler frequency variation at footprints: 1, 70, 140, 210 & 280 Inner Beam (HH)



Footprint wise Doppler frequency variation Outer Beam (VV)

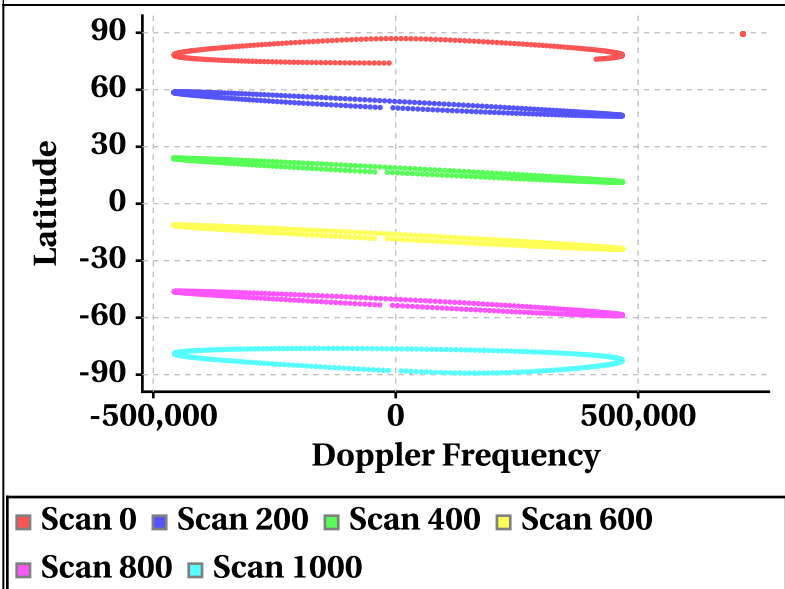


Doppler frequency variation at footprints: 1, 70, 140, 210 & 280 Outer Beam (VV)

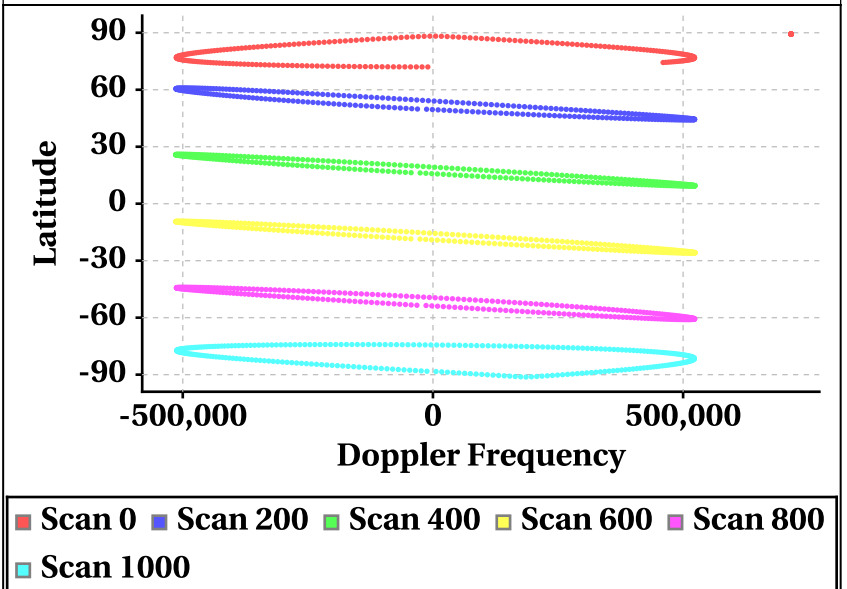


# Latitude Vs Doppler Frequency

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



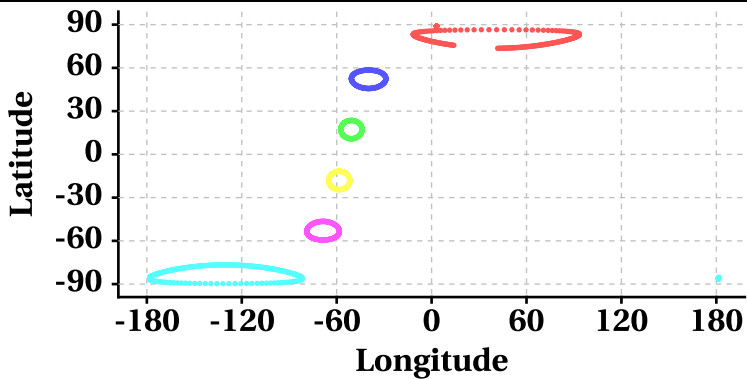
Doppler Frequency at Scan Interval of 200 [Outer Beam(VV)]



# Parameter as a function of Latitude

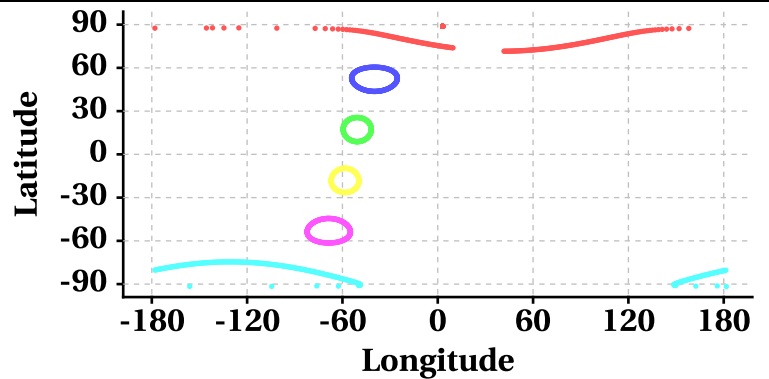
## Latitude Vs Longitude

Scan Trace [Inner Beam(HH)]



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

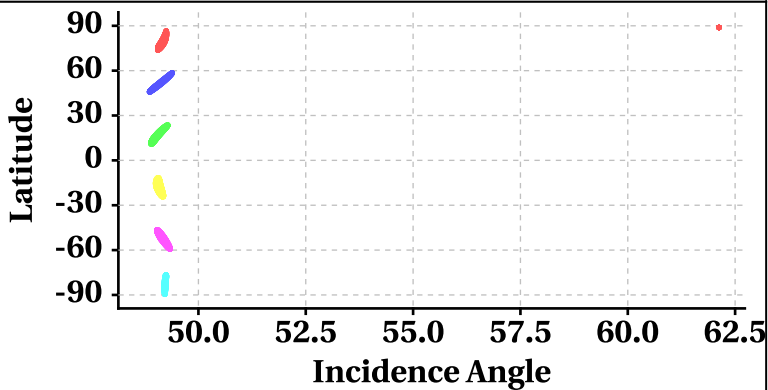
Scan Trace [Outer Beam (VV)]



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

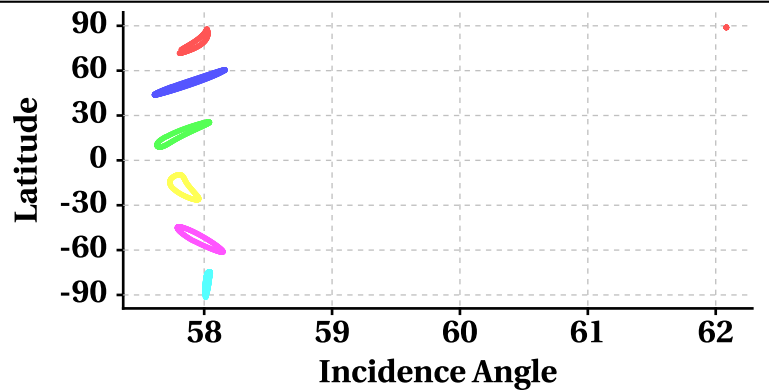
## Latitude Vs Incidence Angle

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



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

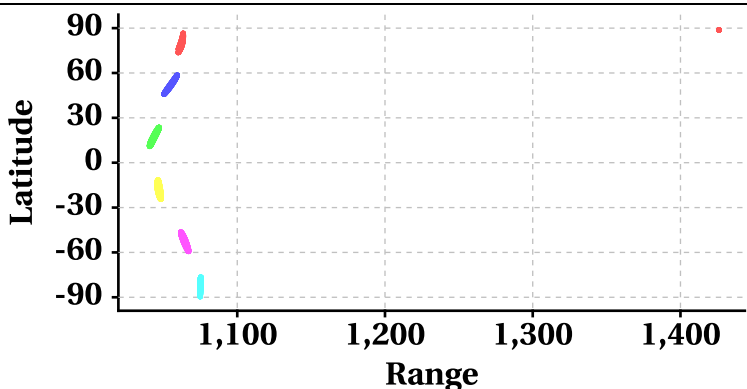
Incidence Angle at Scan Interval of 200 [Outer Beam (VV)]



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

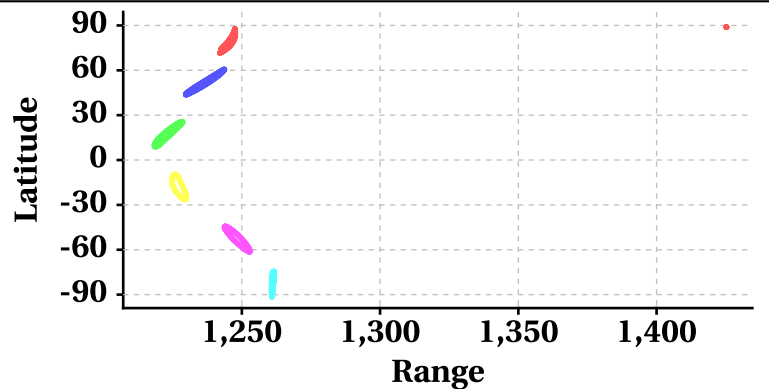
## Latitude Vs Range

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

