

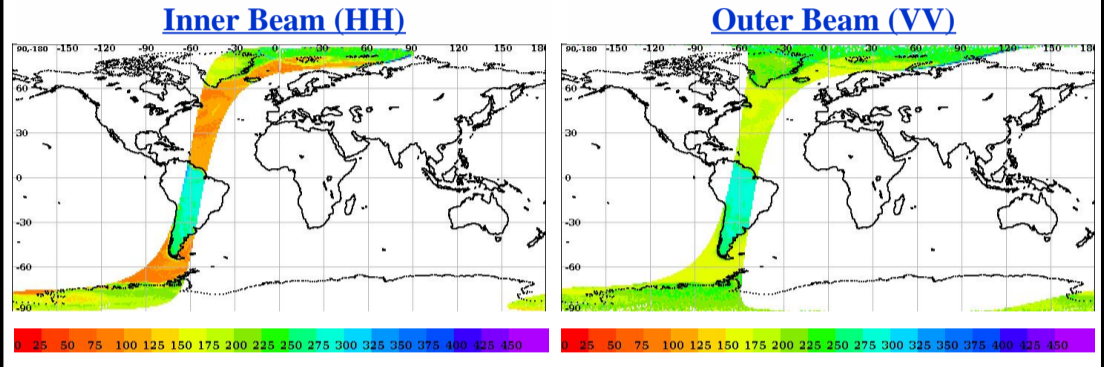
# SCATSAT-1 Scatterometer Level-1B Data Quality Evaluation Report

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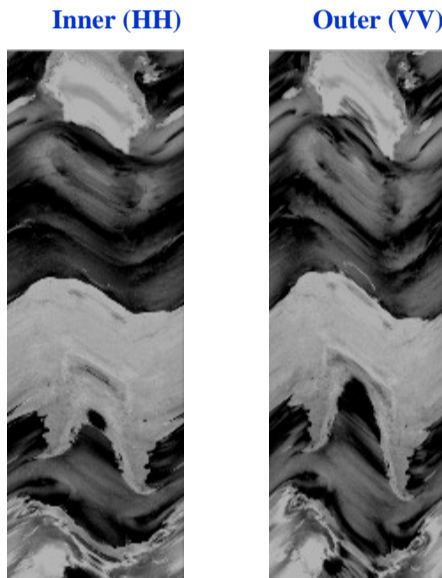
- Half-Orbit Coverage using BT & Sigma-0
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<b>Satellite Id</b>	ScatSat-1	<b>Start Orbit</b>	6993	<b>Total Scans</b>	1016
<b>Sensor Name</b>	Scatterometer	<b>End Orbit</b>	6994	<b>No of Inner FootPrints</b>	281
<b>Processor Version</b>	v1.1.2	<b>Rev. Number</b>	06993_06994	<b>No Of Outer FootPrints</b>	282
<b>Half Orbit Direction</b>	NS	<b>Data Production Date</b>	21-01-2018	<b>No. Of Inner Slices</b>	9
<b>Equator Crossing Date</b>	21-01-2018	<b>Equator Crossing Time</b>	12:30:06.000	<b>No Of Outer Slices</b>	14

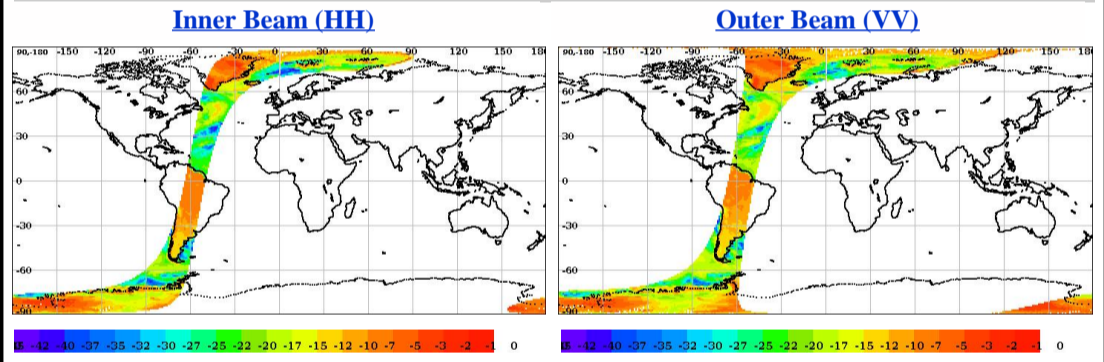
## Brightness Temperature(k) Footprint trace



## Image Snapshot for Inner & Outer Beam



## Sigma0(dB) Footprint trace



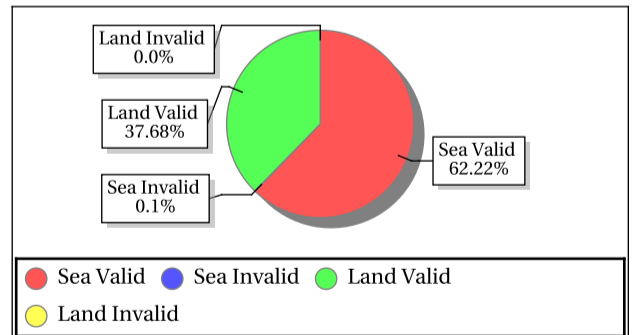
## Invalid and Poor Sigma-0 Quality Flag Statistics for Inner/Outer Slices\*

Sigma-0 Flags	Inner Beam	Outer Beam
Invalid Sigma0(%)	0.10	0.10
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	0.01
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

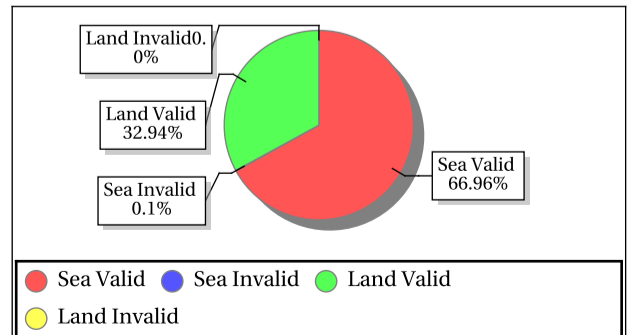
\*DP Format Document

## 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	DSC	Aft	-6.82	-4.92	-5.68	0.55	116.05	180.72	148.93	15.06
GreenLand_2	77.50	-41.50	Inner	DSC	Fore	-6.35	-4.40	-5.46	0.55	133.38	177.28	161.15	12.13
GreenLand_3	71.55	-42.45	Inner	DSC	Aft	-12.16	-9.69	-10.94	0.57	173.92	230.33	193.89	16.34
GreenLand_3	71.55	-42.45	Inner	DSC	Fore	-12.63	-10.10	-11.37	0.66	162.61	213.19	187.67	11.79
Amazon_3	-6.00	-61.00	Inner	DSC	Aft	-9.46	-7.30	-8.21	0.54	257.53	331.60	295.86	17.45
Amazon_3	-6.00	-61.00	Inner	DSC	Fore	-9.78	-6.84	-8.28	0.64	231.29	316.15	281.31	17.93
GreenLand_1	74.69	-42.50	Inner	DSC	Aft	-10.24	-8.37	-9.30	0.45	151.28	198.04	171.16	13.39
GreenLand_1	74.69	-42.50	Inner	DSC	Fore	-11.35	-7.87	-9.48	0.72	137.87	196.36	170.62	14.45
Amazon_2	-3.00	-61.00	Inner	DSC	Aft	-13.16	-7.58	-9.11	1.03	217.00	341.83	274.47	24.79
Amazon_2	-3.00	-61.00	Inner	DSC	Fore	-11.25	-7.48	-9.22	0.81	209.00	320.84	271.20	25.58
GreenLand_2	77.50	-41.50	Outer	DSC	Aft	-5.51	-4.91	-5.19	0.25	204.77	221.90	211.33	6.03
GreenLand_2	77.50	-41.50	Outer	DSC	Fore	-5.93	-4.83	-5.34	0.39	215.33	241.88	223.28	10.82
GreenLand_3	71.55	-42.45	Outer	DSC	Aft	-11.93	-10.39	-11.15	0.43	213.88	245.55	225.73	10.11
GreenLand_3	71.55	-42.45	Outer	DSC	Fore	-12.89	-11.37	-12.13	0.42	202.02	259.69	218.78	16.65
Amazon_3	-6.00	-61.00	Outer	DSC	Aft	-9.90	-8.52	-9.24	0.37	251.56	325.45	282.57	21.25
Amazon_3	-6.00	-61.00	Outer	DSC	Fore	-10.55	-8.66	-9.55	0.48	253.63	313.33	283.81	16.10
GreenLand_1	74.69	-42.50	Outer	DSC	Aft	-10.08	-8.56	-9.22	0.51	199.52	243.86	221.30	15.24
GreenLand_1	74.69	-42.50	Outer	DSC	Fore	-9.94	-8.22	-9.17	0.52	197.67	270.86	239.00	19.91
Amazon_2	-3.00	-61.00	Outer	DSC	Aft	-12.02	-9.10	-10.11	0.79	255.37	311.52	280.54	15.68
Amazon_2	-3.00	-61.00	Outer	DSC	Fore	-11.37	-8.66	-10.16	0.68	232.81	302.68	272.01	18.89



## 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	179.21	0.22	1.549	0.10	220.20	0.21	1.313	0.10	0.53	0.10	0.000	0.10	0.50	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>	-33.27	21.73	6.18	0.000	-34.16	23.60	6.89	0.059	-7.28	27.73	18.93	11.348	-6.93	29.36	20.42	32.061

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	212.14	0.24	2.075	0.08	198.37	0.23	1.878	0.08	0.20	0.09	0.000	0.08	0.15	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	0.01	0.00	0.000	0.00	0.00	0.00	0.000
<b>SNR</b>	-34.88	17.57	4.28	0.000	-34.59	17.75	4.60	0.000	-2.77	22.95	14.22	0.079	-0.45	23.71	15.05	0.899

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>	48.68	49.34	48.99	0.000	57.46	58.20	57.83	0.000	Inci.(Inner)	47.10	49.90
<b>Azimuth Diff. (deg)</b>	0.0027	6.30	1.27	2.607	0.0000	296.20	1.27	3.795	Inci.(Outer)	57.30	58.90
<b>Range(Km)</b>	1018.06	1080.04	1040.18	27.280	1193.46	1269.97	1221.04	41.017	Azimuth Diff.	0.60	2.00
<b>X Factor(dbm)</b>	-91.48	-88.63	-89.86	0.000	-93.36	-91.09	-91.86	0.000	Range(Inner)	1025.00	1095.70
<b>Across Distance (Km)</b>	15.84	16.46	16.09	0.000	11.04	38.01	21.28	4.000	Range(Outer)	1210.00	1280.00
<b>Along Distance (Km)</b>	18.86	8742.58	36.95	2.000	9.52	8567.62	36.53	4.000	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

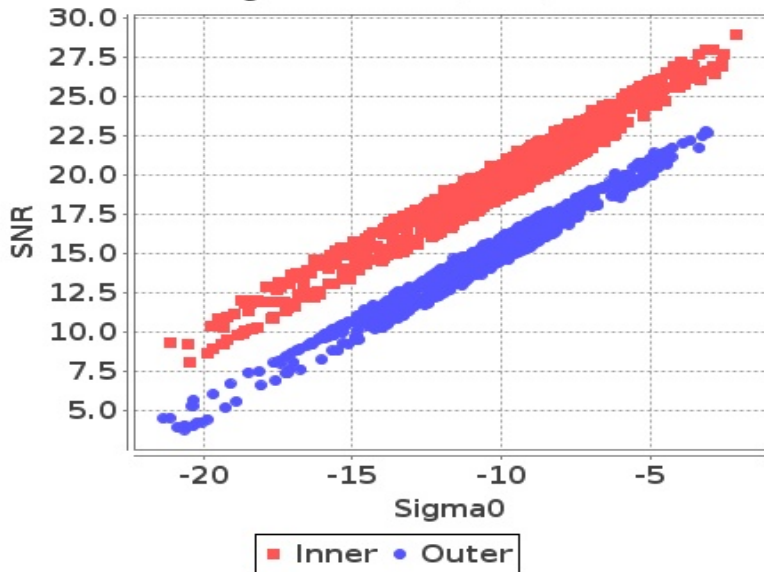
- Normal
- Deviations
- Alarming
- High Errors



# Sigma0 Behaviour (Sigma0 Vs SNR)

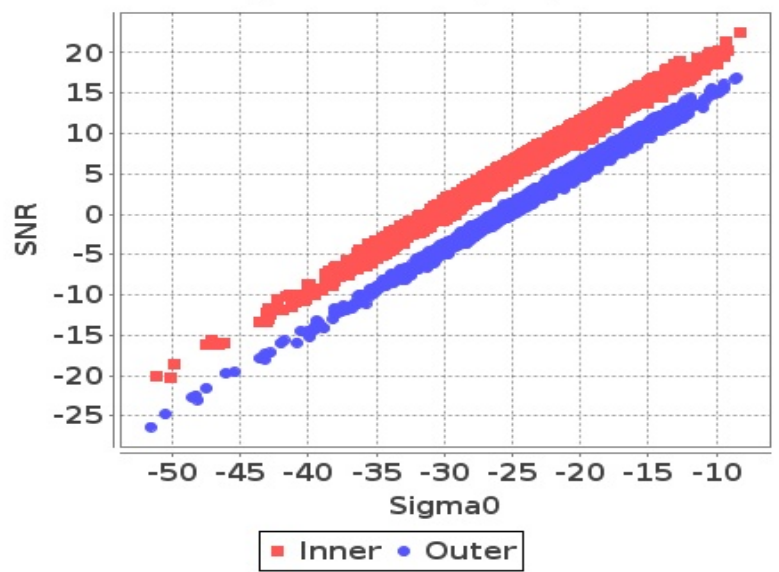
### Footprint-Land

#### Sigma0 Vs SNR (Land)



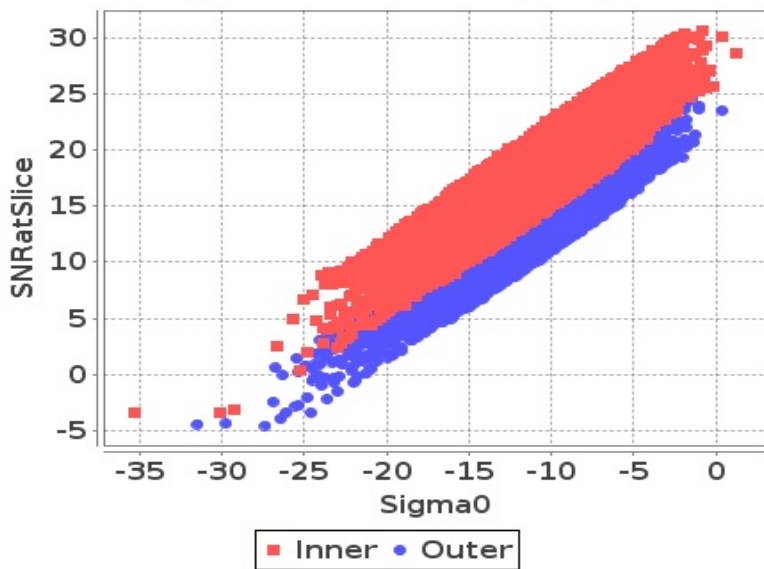
### Footprint-Sea

#### Sigma0 Vs SNR (Sea)



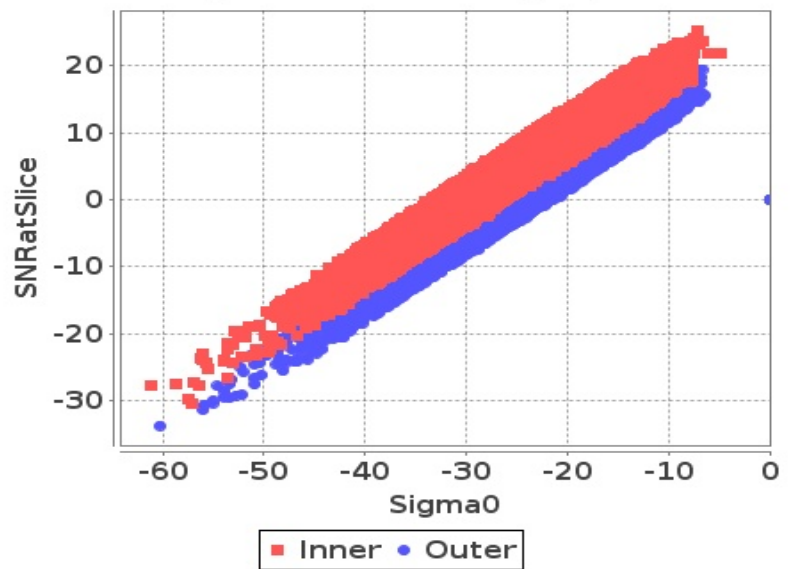
### Slice-Land

#### Sigma0 Vs SNRatSlice (Land)



### Slice-Sea

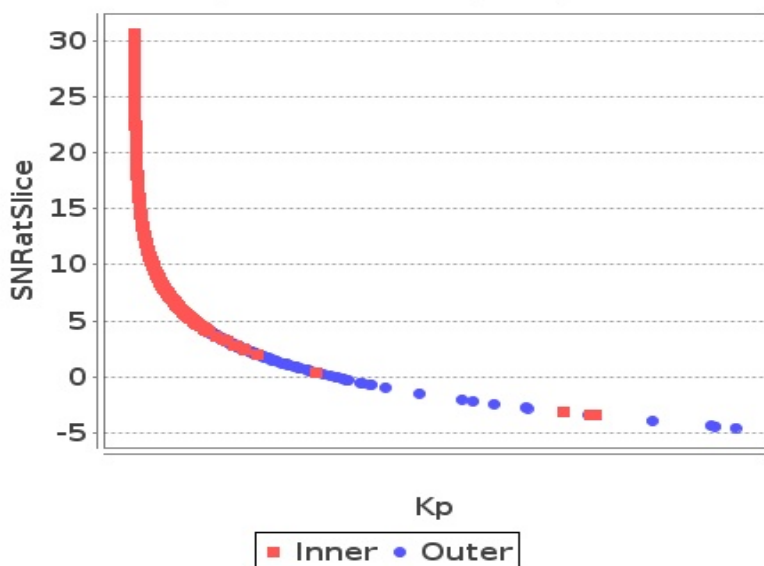
#### Sigma0 Vs SNRatSlice (Sea)



# Sigma0 Behaviour (Kp Vs SNR)

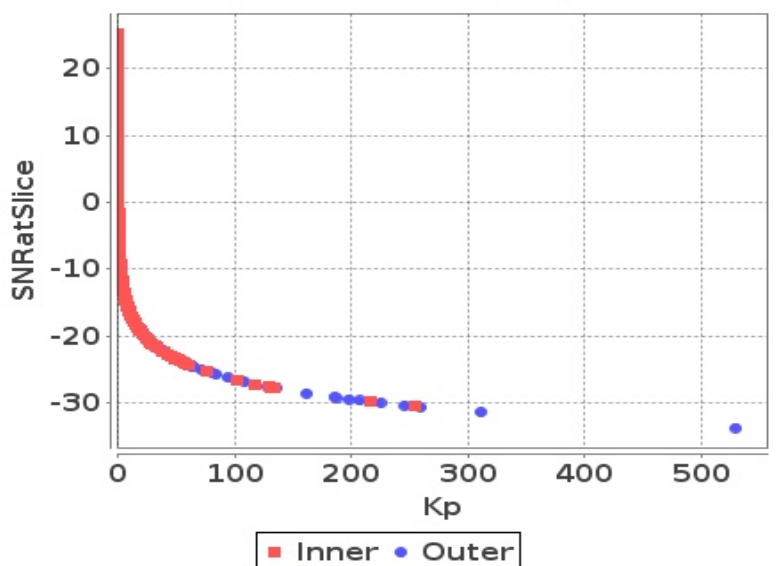
### Slice

#### Kp Vs SNRatSlice (Land)



### Slice

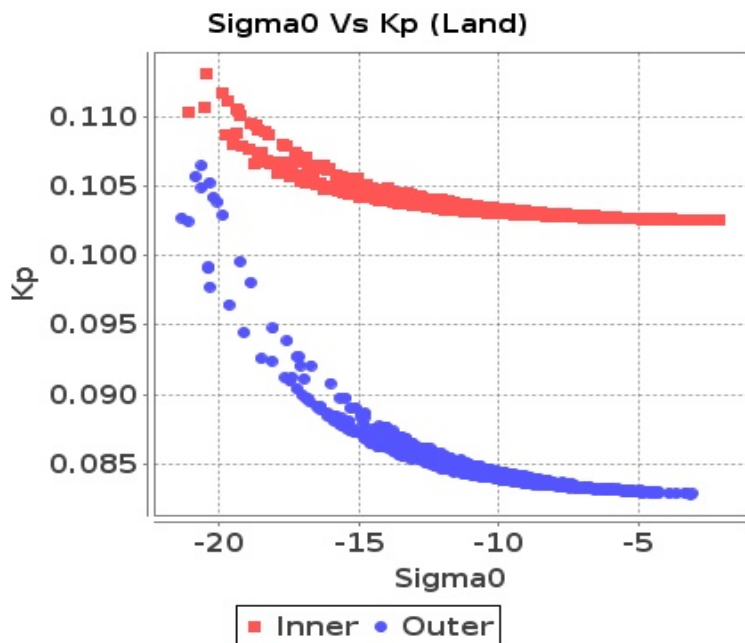
#### Kp Vs SNRatSlice (Sea)



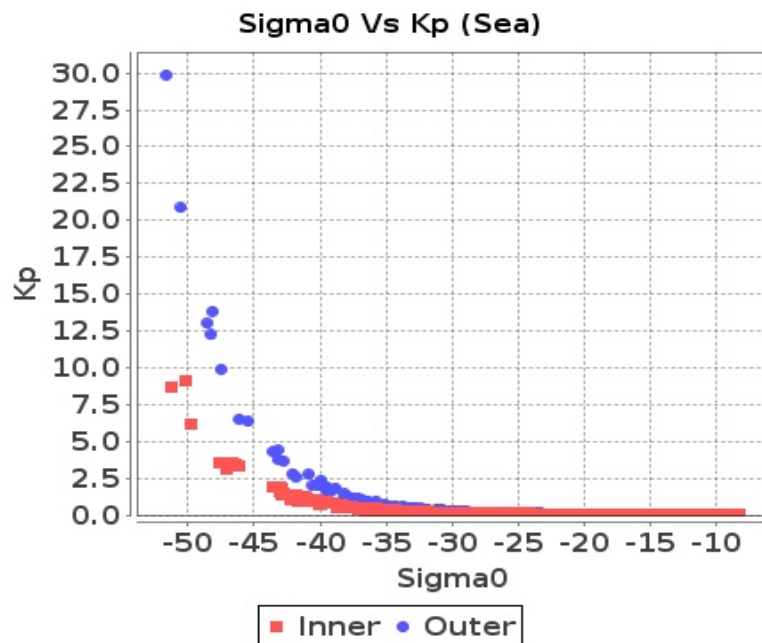


# Sigma0 Behaviour(Sigma0 Vs Kp)

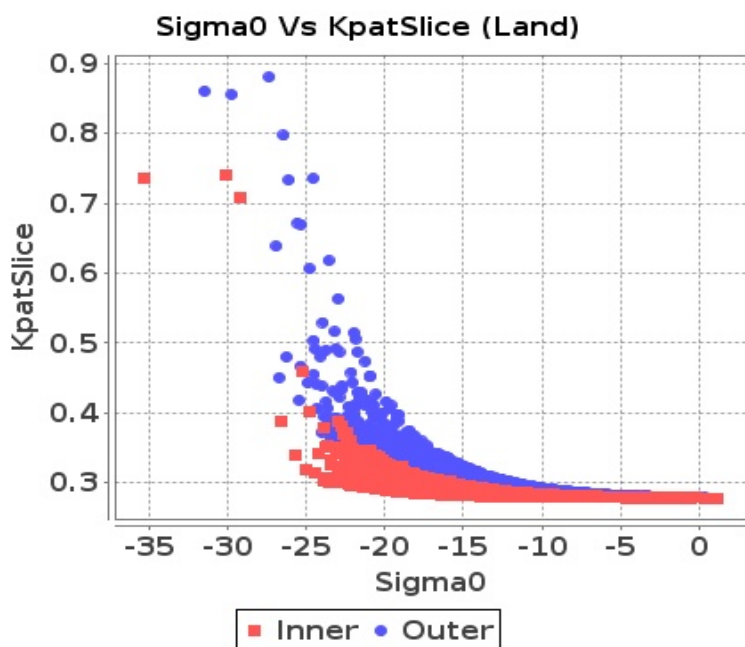
## Footprint-Land



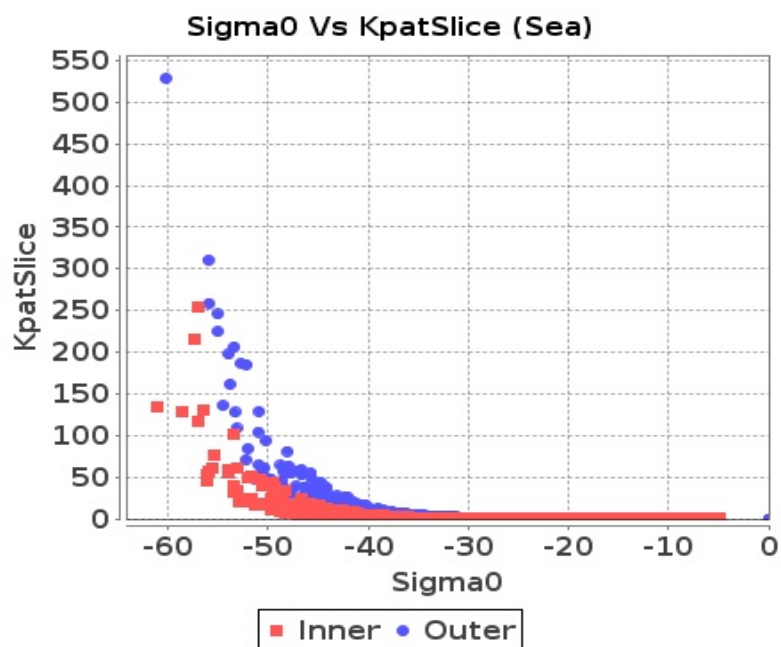
## Footprint-Sea



## Slice-Land



## Slice-Sea

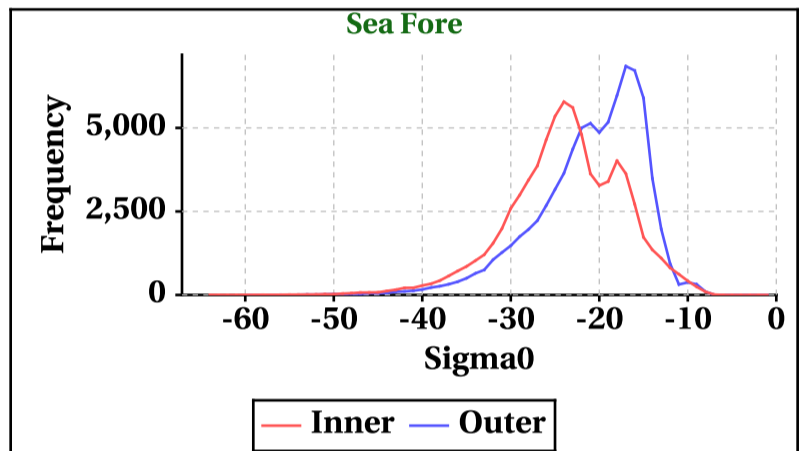
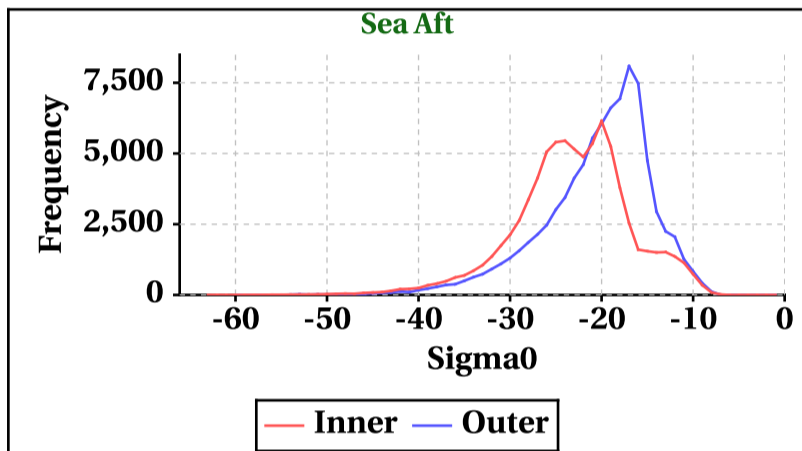
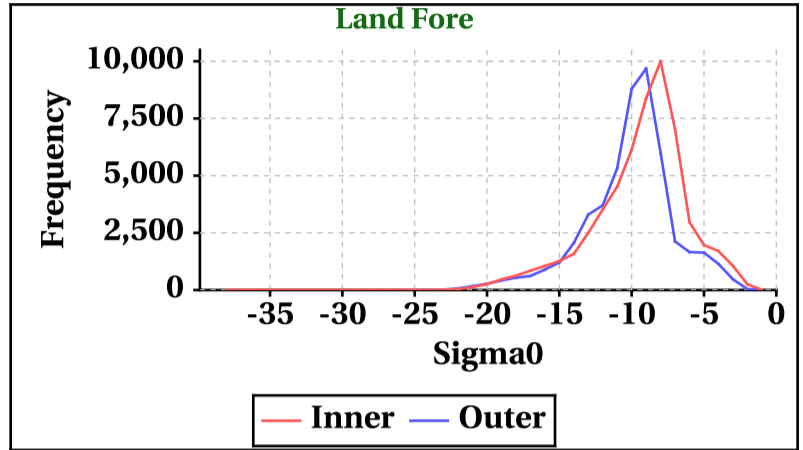
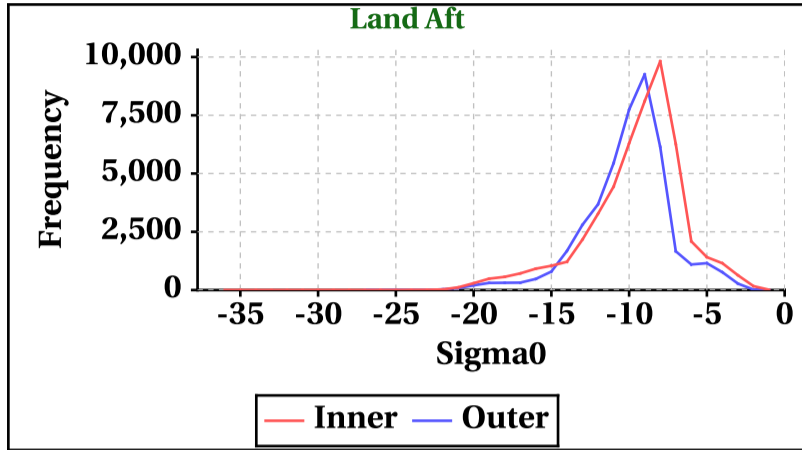


# Dynamic Range (Data Histograms)

## Sigma0(db)

Inner Beam (HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-36	-38	-63	-64
Max	0	0	0	0

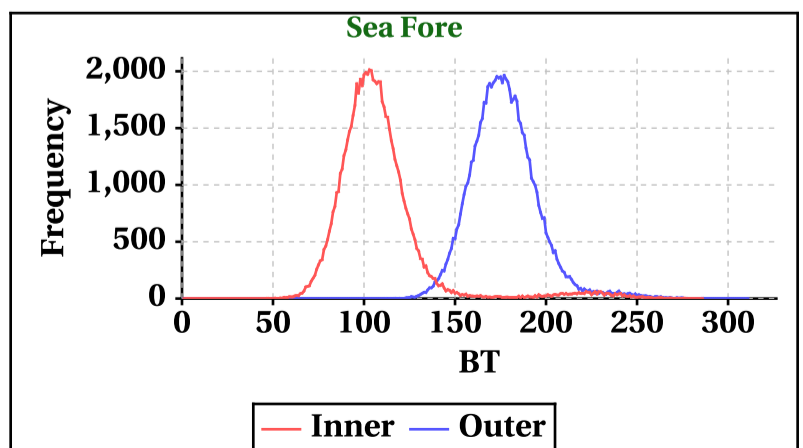
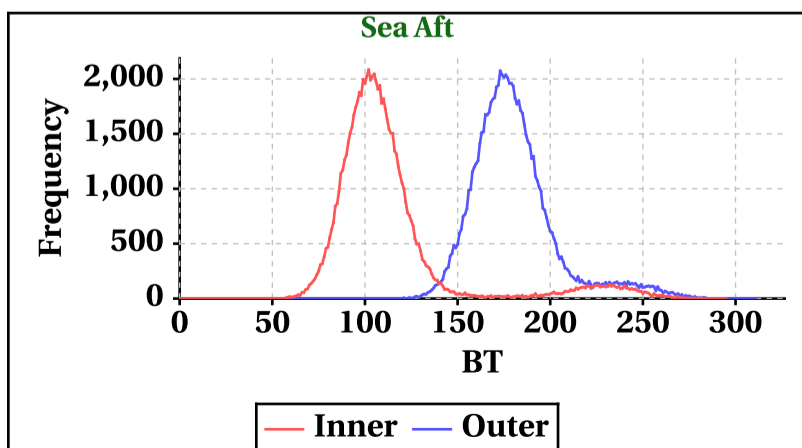
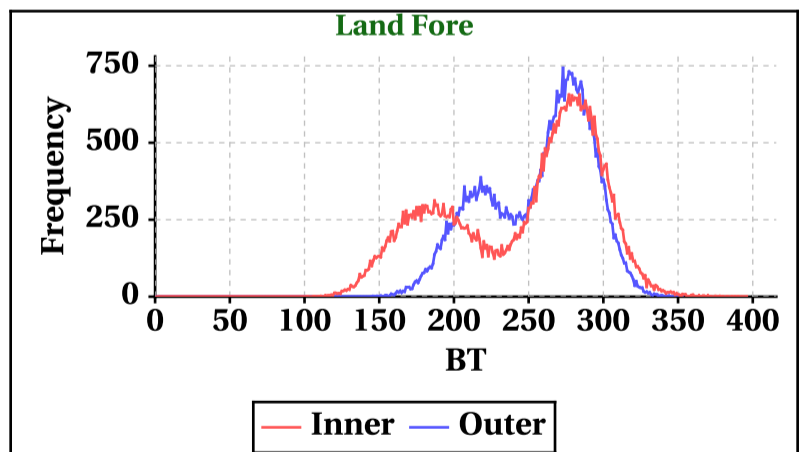
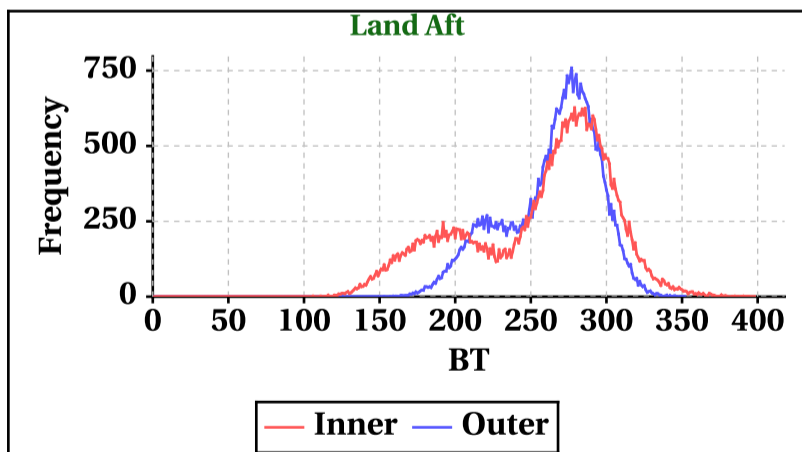
Outer Beam (VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-27	-26	-60	-60
Max	0	0	0	0



## Brightness Temperature(K)

Inner Beam(HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	0	0
Max	398	396	295	286

Outer Beam(VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	0	0
Max	352	353	311	311

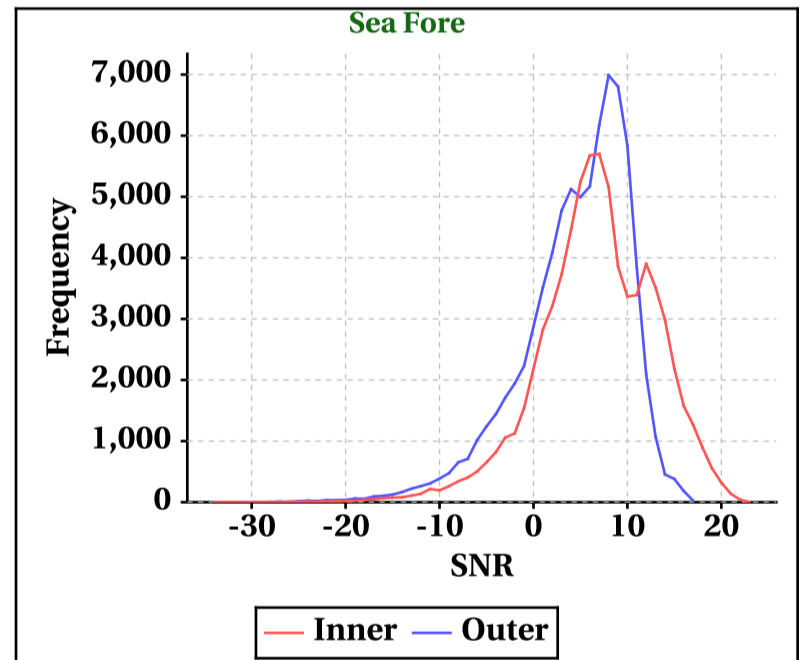
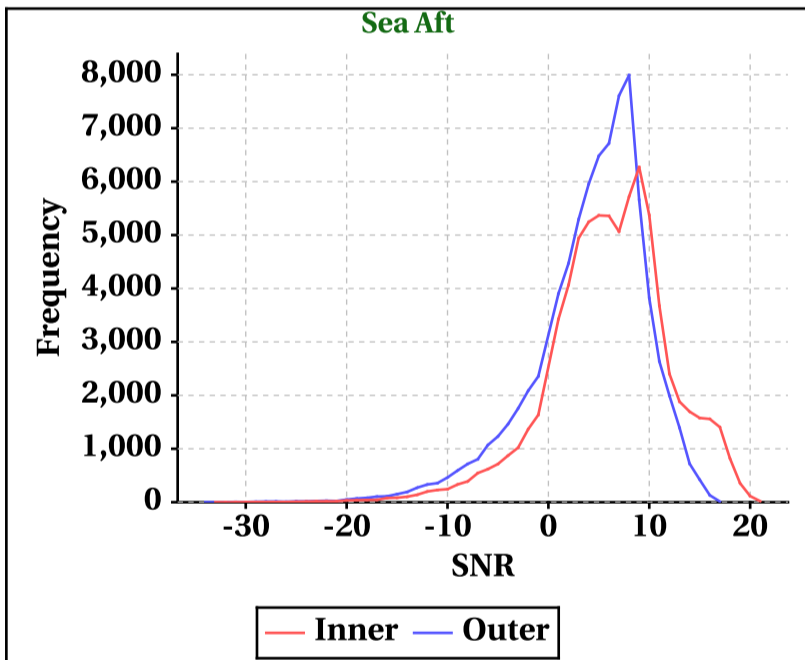
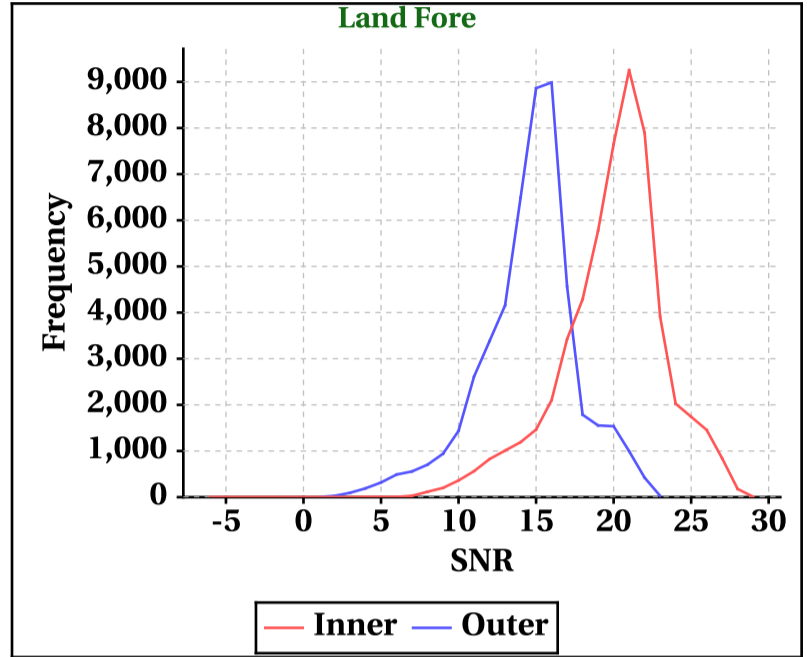
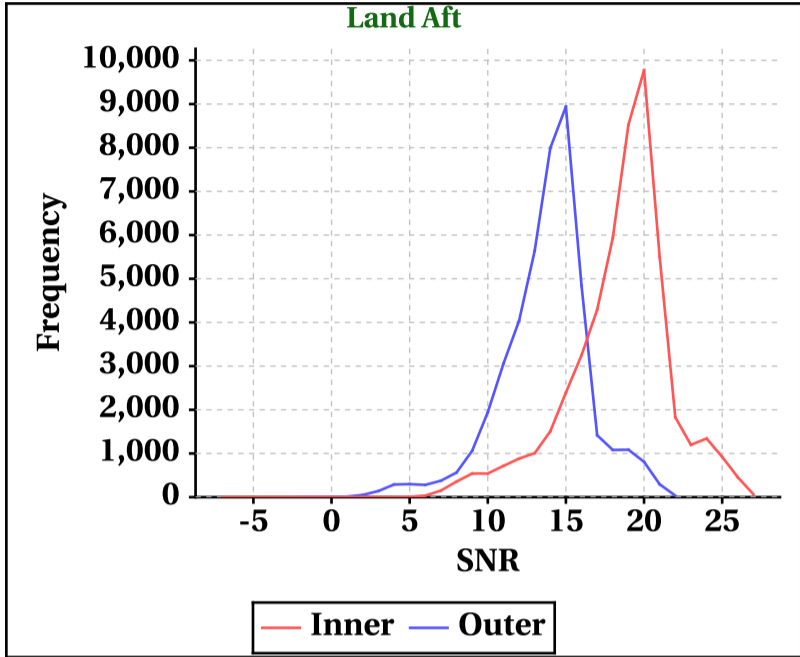


# Dynamic Range (Data Histograms)

## SNR(dBm)

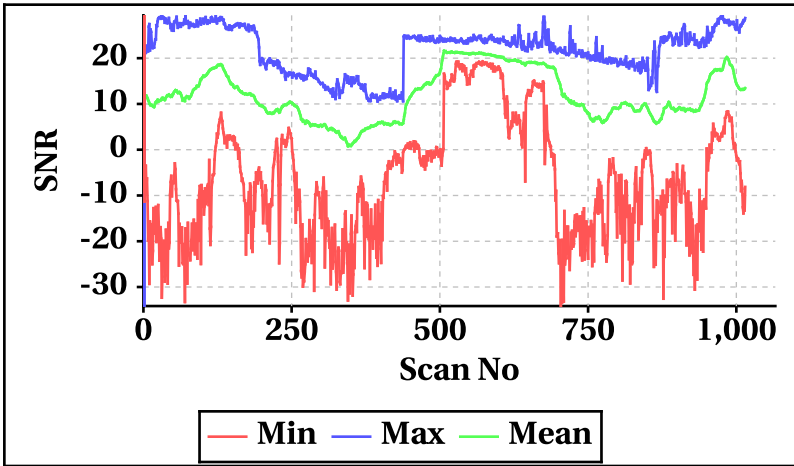
Inner Beam (HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-7	-6	-33	-34
Max	27	29	21	23

Outer Beam (VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-2	0	-34	-34
Max	22	23	17	17

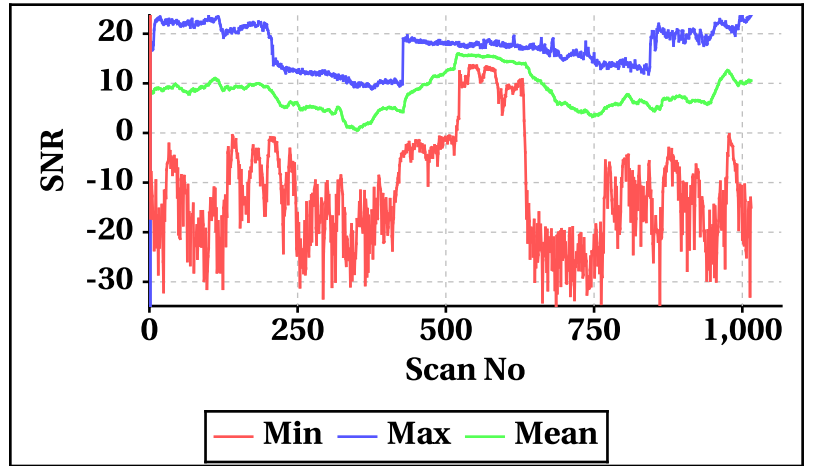


## Orbit-wise behaviour of SNR

Inner Beam (HH)

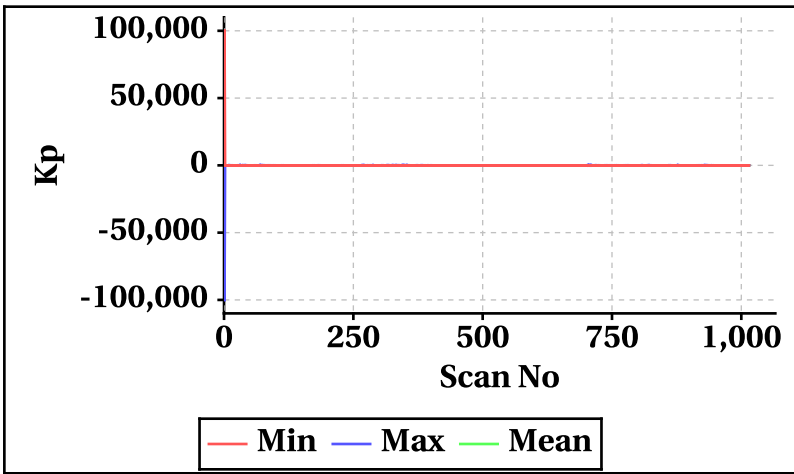


Outer Beam(VV)

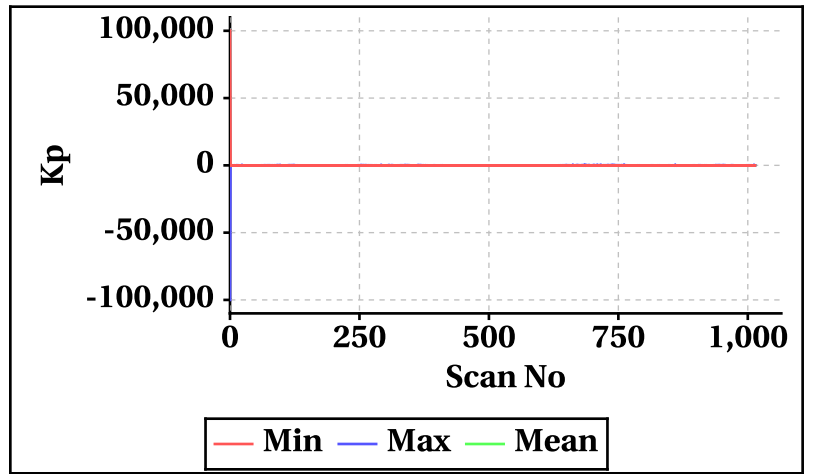


## Orbit-wise behaviour of Kp,Kpa,Kpb,Kpc

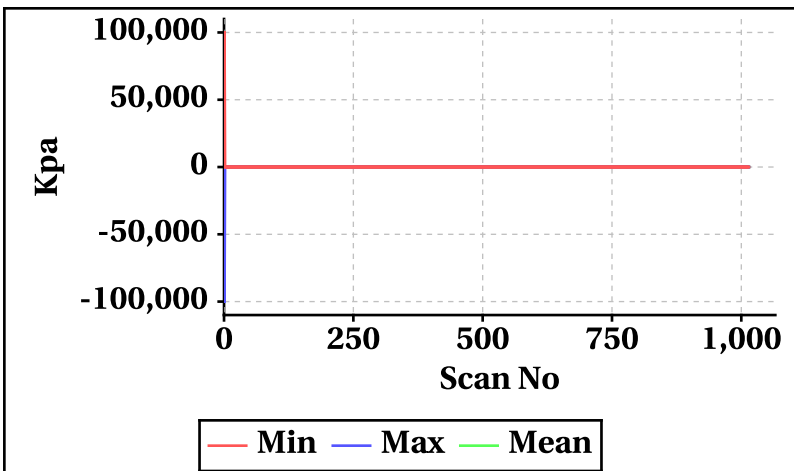
Inner Beam(HH)



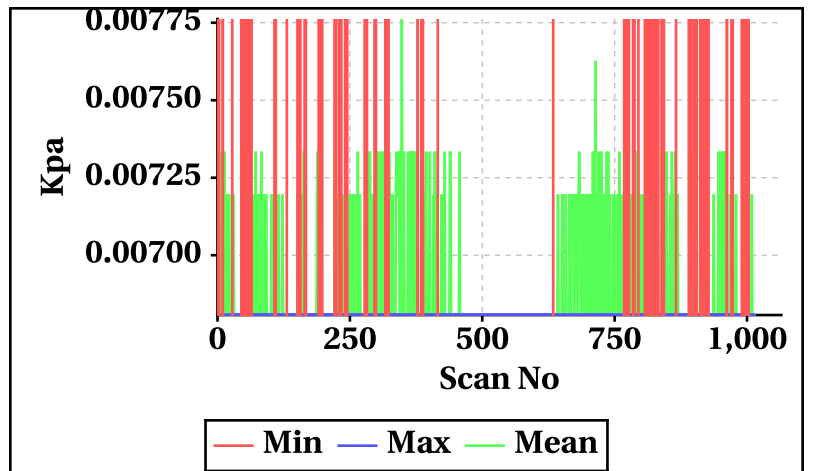
Outer Beam(VV)



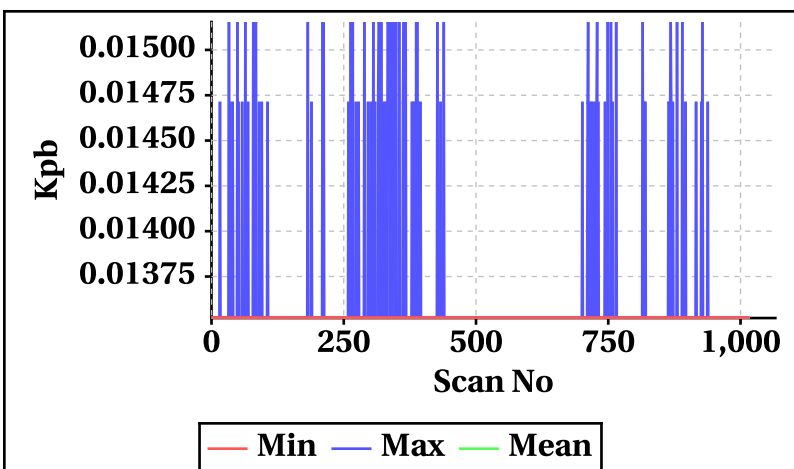
Inner Beam(HH)



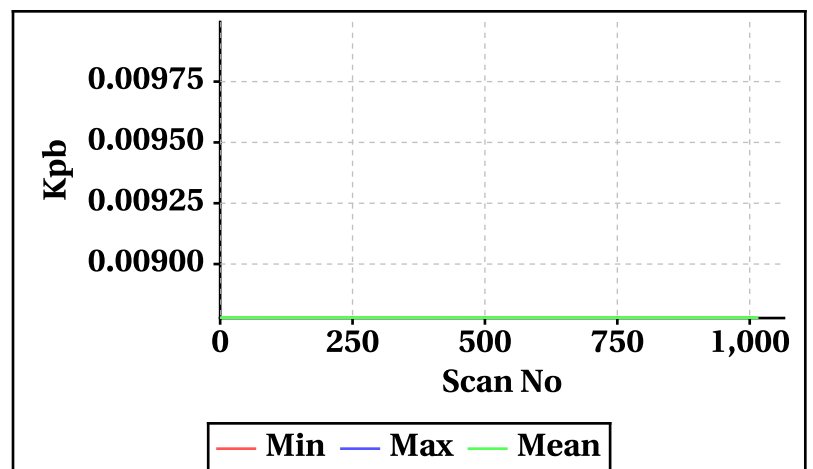
Outer Beam(VV)



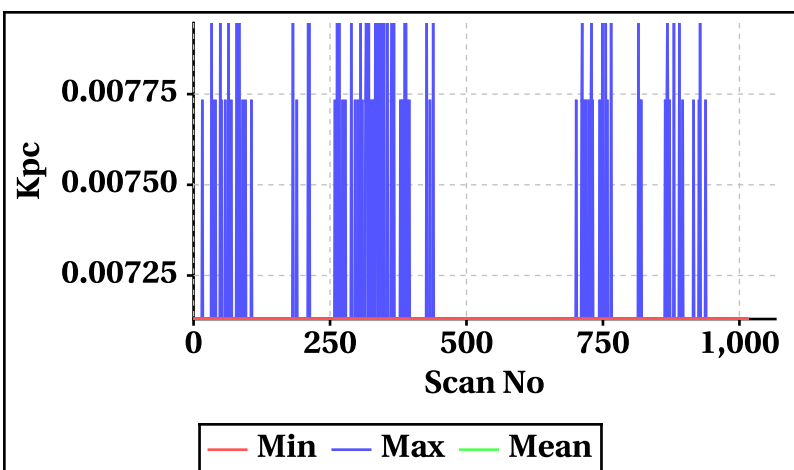
Inner Beam(HH)



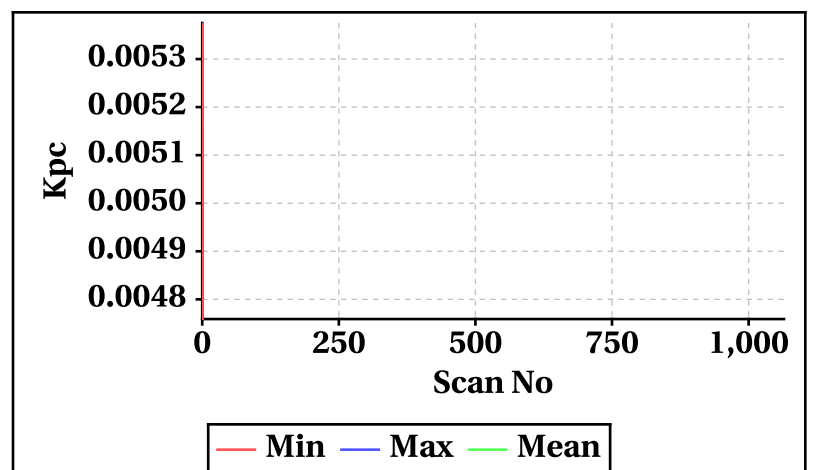
Outer Beam(VV)



Inner Beam(HH)



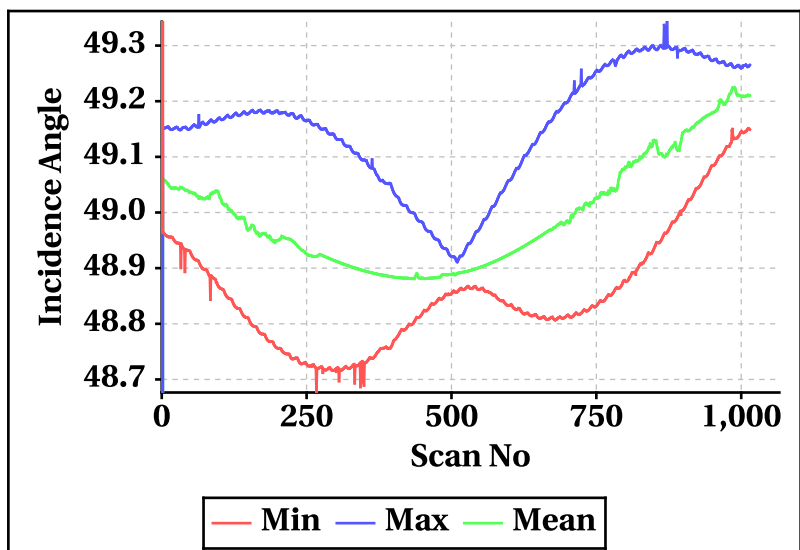
Outer Beam(VV)



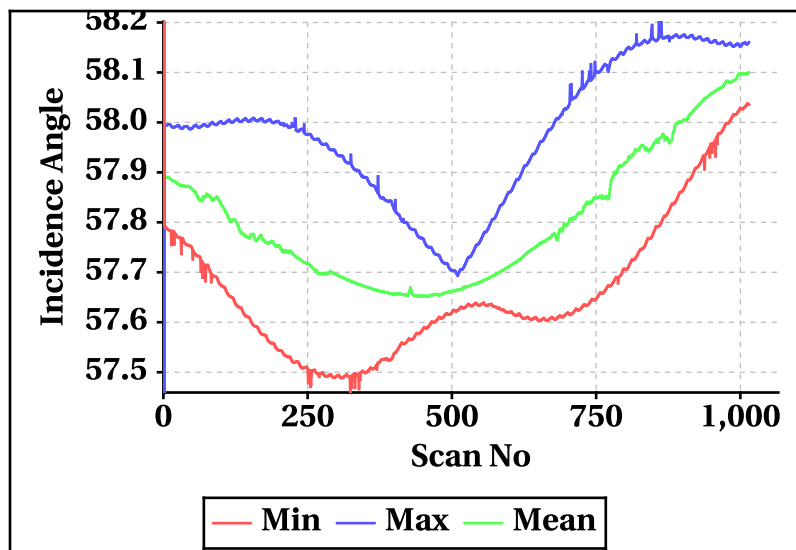


# Orbit-wise behaviour of Incidence, Azimuth, Range, X-Factor

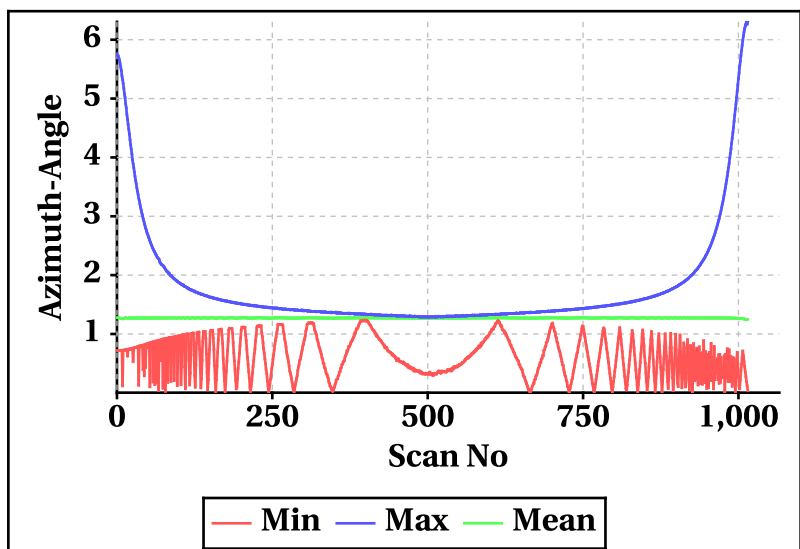
**Inner Beam (HH)**



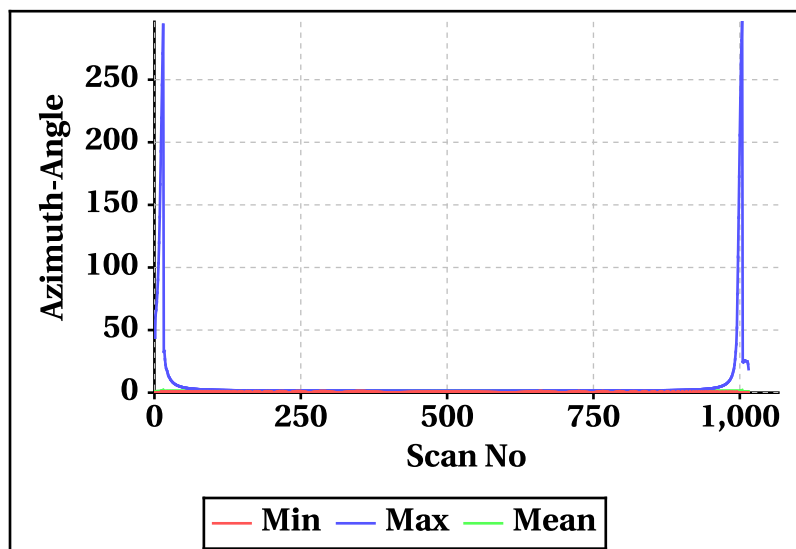
**Outer Beam(VV)**



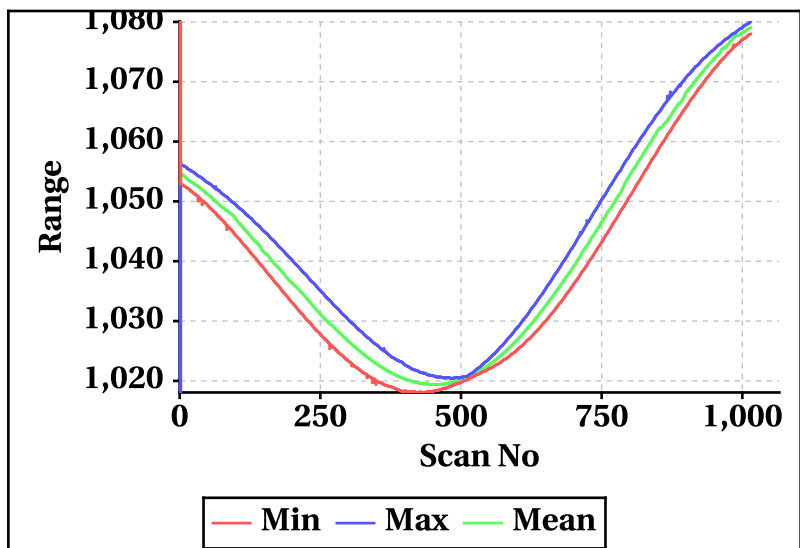
**Inner Beam (HH)**



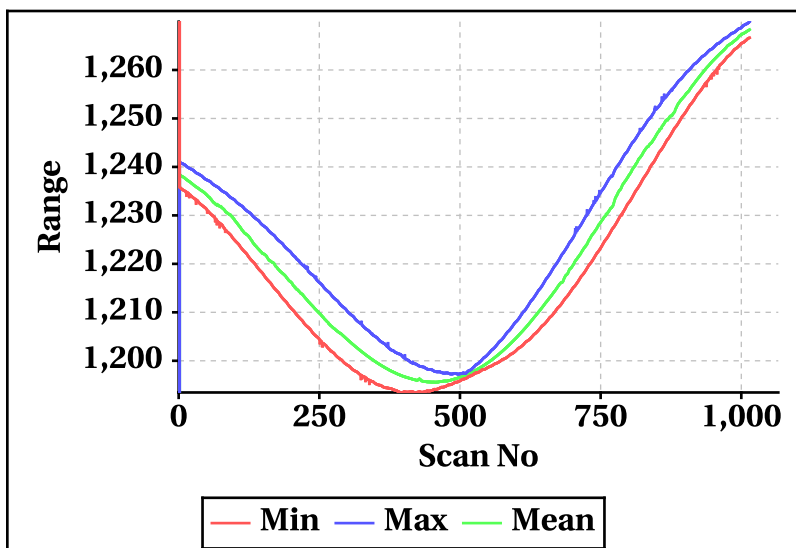
**Outer Beam(VV)**



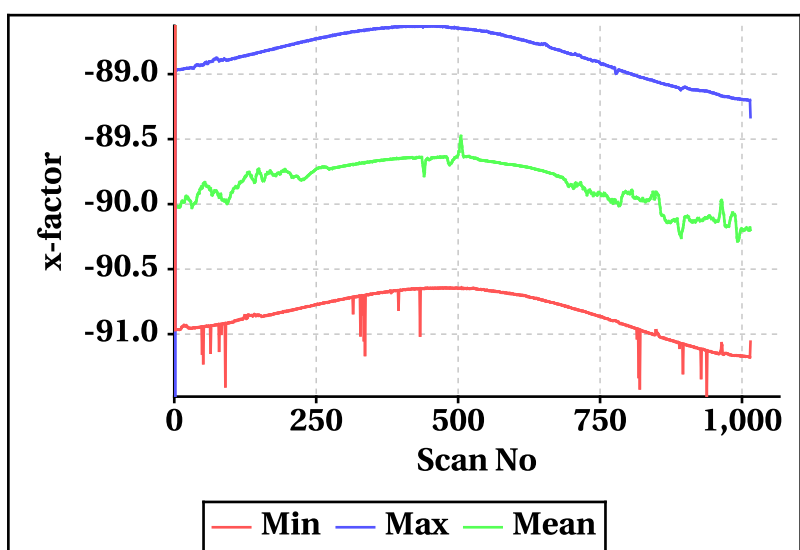
**Inner Beam (HH)**



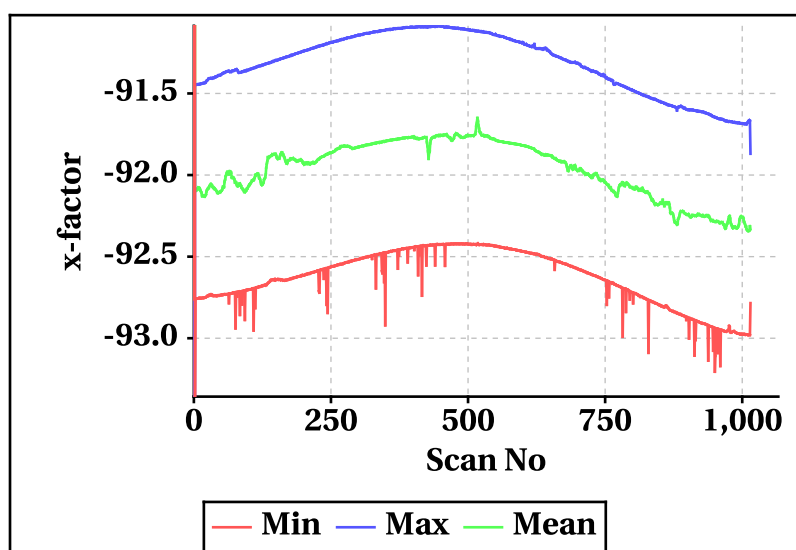
**Outer Beam(VV)**



**Inner Beam (HH)**



**Outer Beam(VV)**

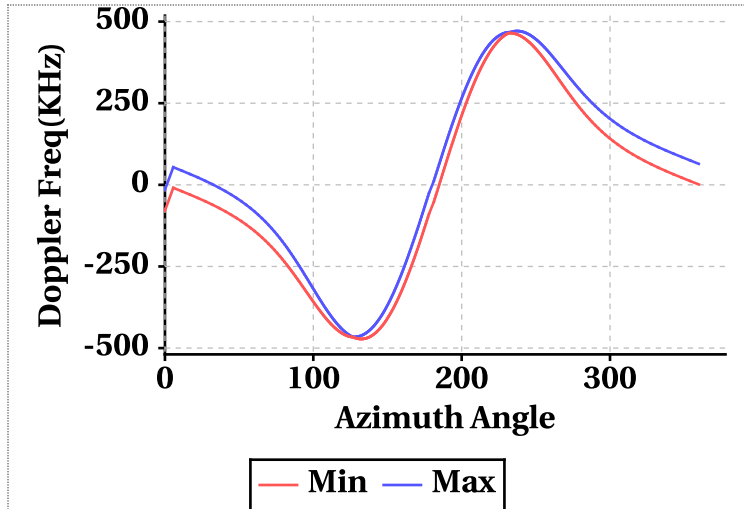


# Doppler Frequency Variation

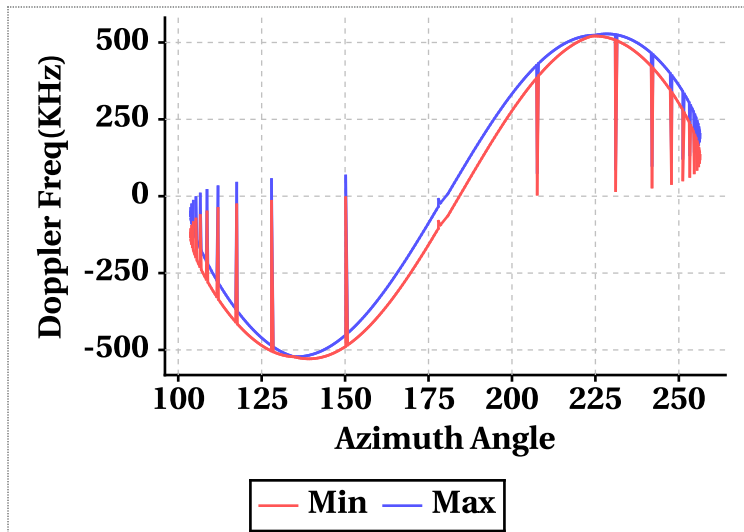
Doppler Frequency(KHz) variation statistics Over the half Orbit

	Inner Beam (HH)	Outer Beam (VV)
Min	-472.08	-528.90
Max	470.96	527.94

Footprint wise Doppler frequency variation Inner Beam (HH)



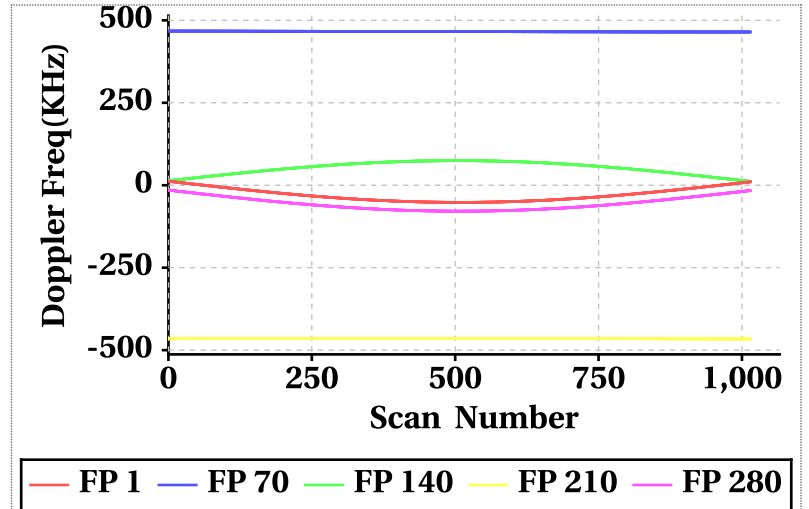
Footprint wise Doppler frequency variation Outer Beam (VV)



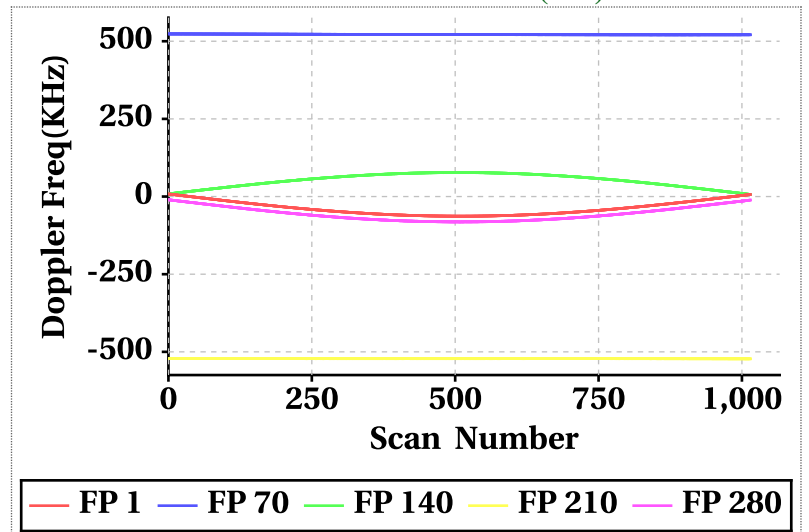
Doppler Frequency(KHz) variation

Doppler_FP	Inner Beam (HH)			Outer Beam (VV)		
	Min	Max	Mean	Min	Max	Mean
Doppler_1	-51.96	12.06	-28.93	-63.28	8.20	-37.49
Doppler_70	464.64	467.48	465.92	520.70	523.60	521.71
Doppler_140	11.56	74.68	51.97	6.68	77.36	51.85
Doppler_210	-466.16	-464.86	-465.17	-522.42	-521.88	-522.00
Doppler_280	-78.82	-14.90	-55.62	-81.74	-10.36	-55.77

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

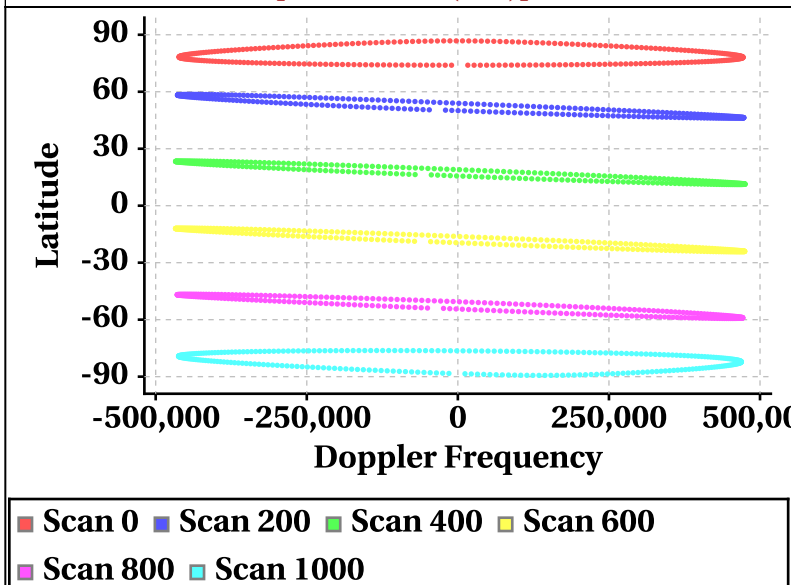


Doppler frequency variation at footprints: 1, 70, 140, 210 & 280 Outer Beam (VV)

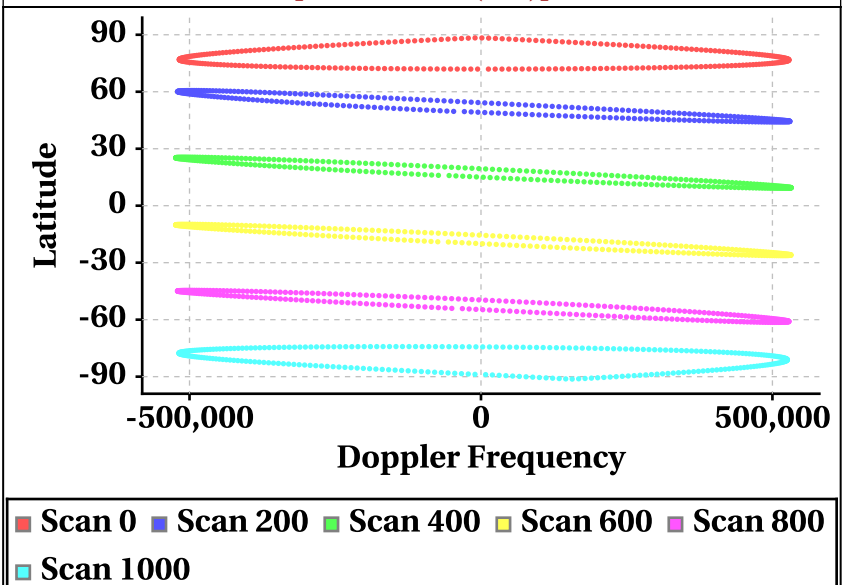


# Latitude Vs Doppler Frequency

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



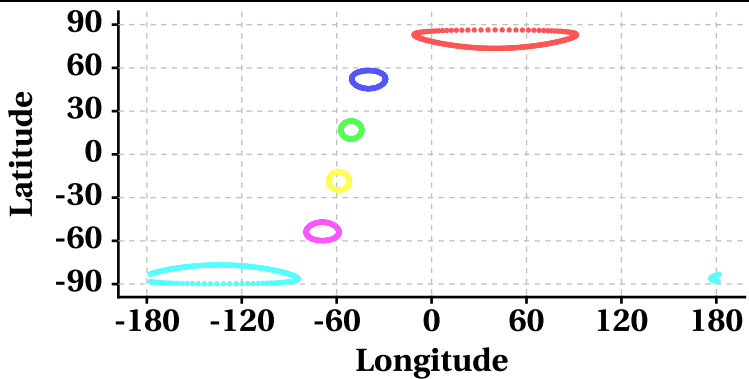
Doppler Frequency at Scan Interval of 200 [Outer Beam(VV)]



# Parameter as a function of Latitude

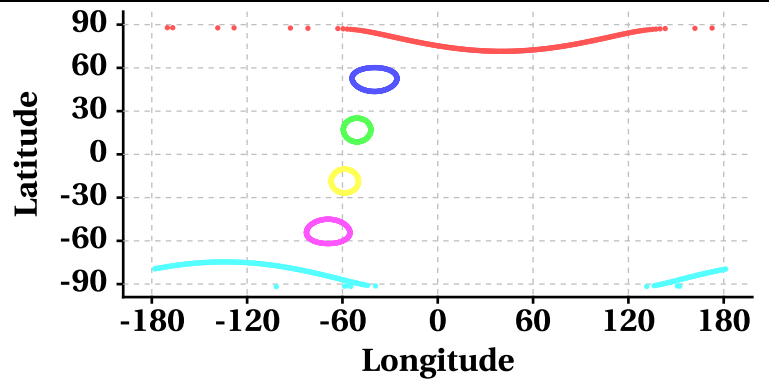
## Latitude Vs Longitude

Scan Trace [Inner Beam(HH)]



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

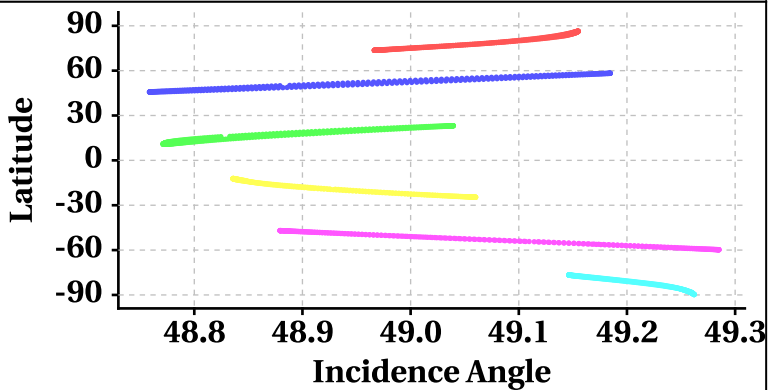
Scan Trace [Outer Beam (VV)]



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

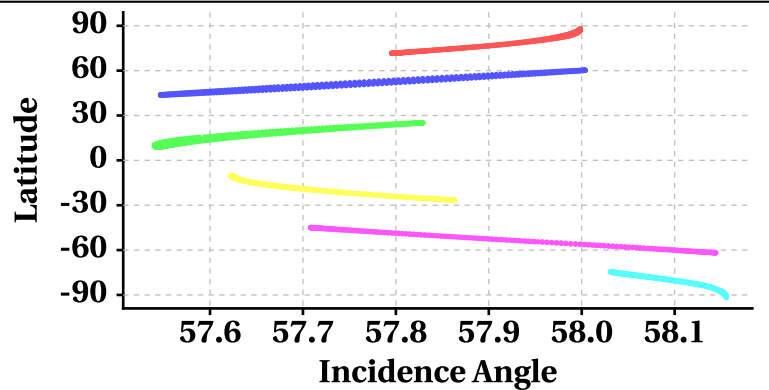
## Latitude Vs Incidence Angle

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



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

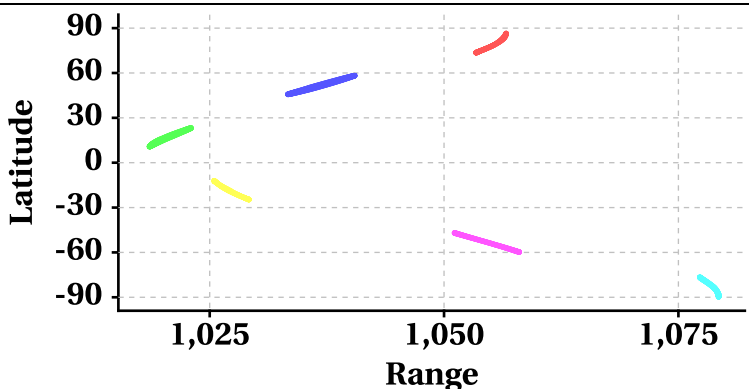
Incidence Angle at Scan Interval of 200 [Outer Beam (VV)]



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

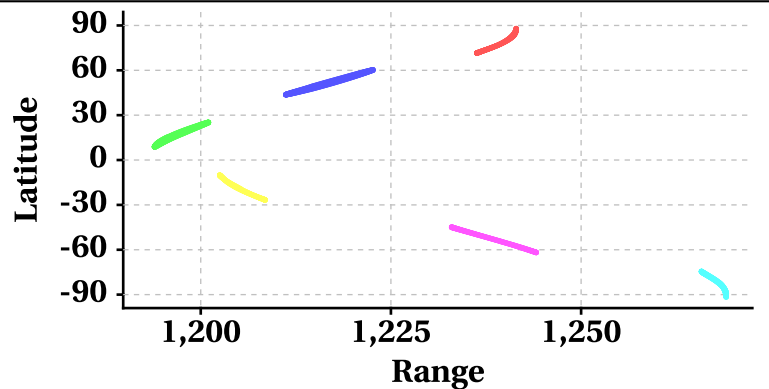
## Latitude Vs Range

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

