

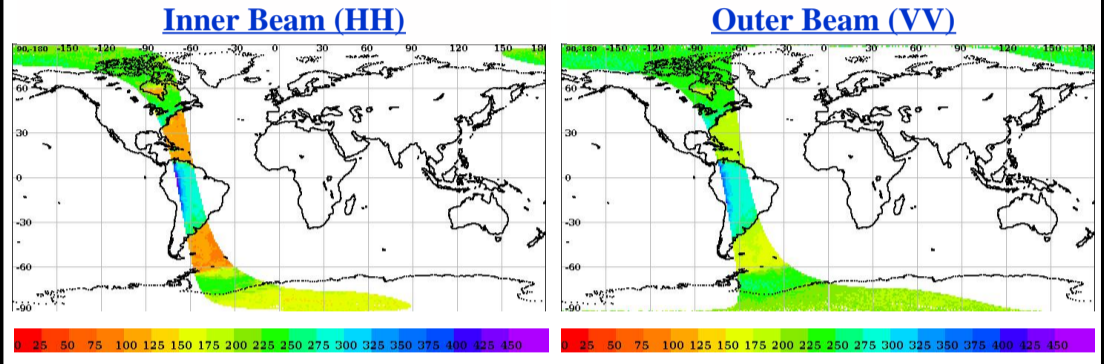
# SCATSAT-1 Scatterometer Level-1B Data Quality Evaluation Report

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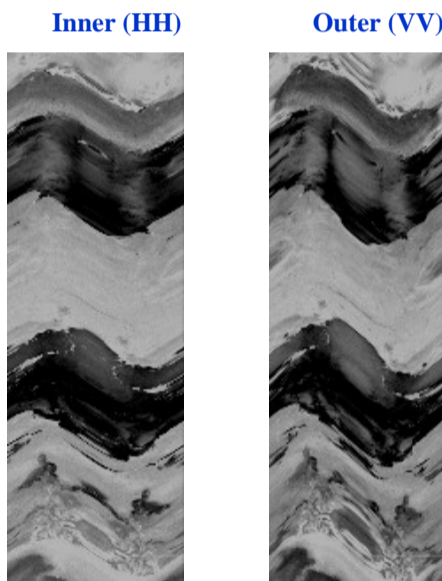
- Half-Orbit Coverage using BT & Sigma-0
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<b>Satellite Id</b>	ScatSat-1	<b>Start Orbit</b>	11379	<b>Total Scans</b>	1017
<b>Sensor Name</b>	Scatterometer	<b>End Orbit</b>	11380	<b>No of Inner FootPrints</b>	281
<b>Processor Version</b>	v1.1.3	<b>Rev. Number</b>	11379_11380	<b>No Of Outer FootPrints</b>	282
<b>Half Orbit Direction</b>	SN	<b>Data Production Date</b>	20-11-2018	<b>No. Of Inner Slices</b>	9
<b>Equator Crossing Date</b>	20-11-2018	<b>Equator Crossing Time</b>	00:50:42.000	<b>No Of Outer Slices</b>	15

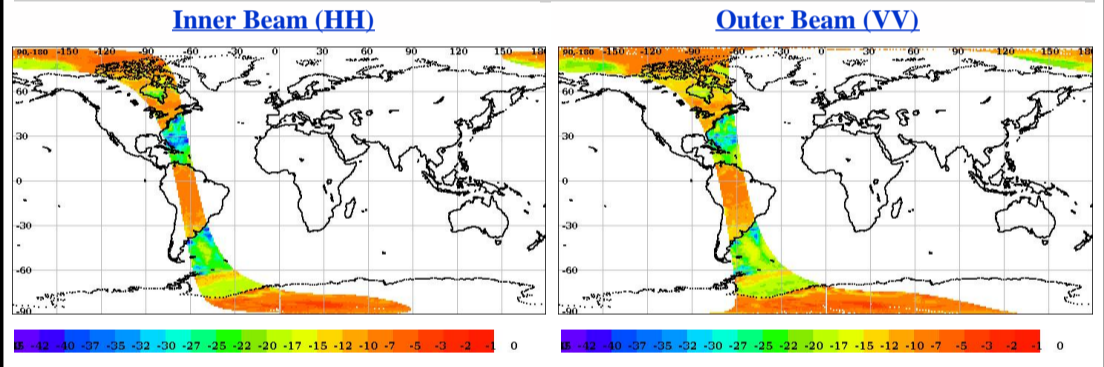
## Brightness Temperature(k) Footprint trace



## Image Snapshot for Inner & Outer Beam



## Sigma0(dB) Footprint trace



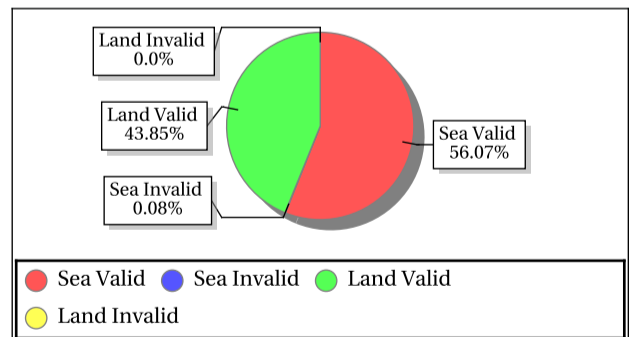
## Invalid and Poor Sigma-0 Quality Flag Statistics for Inner/Outer Slices\*

Sigma-0 Flags	Inner Beam	Outer Beam
Invalid Sigma0(%)	0.05	0.37
Data Not Available From Payload (%)	91.76984	13.45847
Slice not within sample array limits (%)	8.23	86.54
C(S+N) - C(N) < 0.1 (%)	0.00	0.00
Poor Sigma0(%)	22.24	13.34
Noise samples for blending Saturated	0.111869	0.026837
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 (%)	0.019927	0.036945

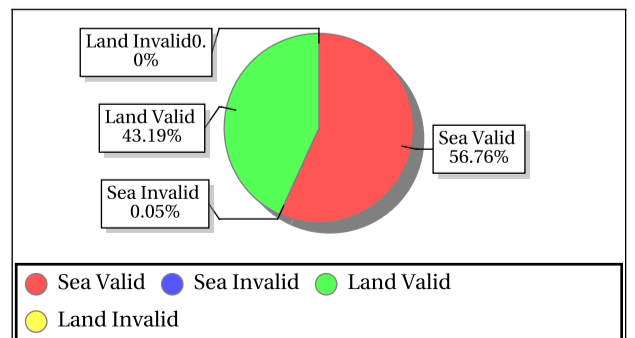
\*DP Format Document

## Sigma-0 Quality Flag Statistics for Inner/Outer Footprints

### Inner Beam (HH)



### Outer Beam (VV)



## Invariant Site Sigma-0 Statistics for Ascending/Descending, Fore/Aft in HH/VV beams

Site Name	Center Lat	Center Lon	Beam	Node	ScanDir	Sigma0 Min	Sigma0 Max	Sigma0 Mean	Sigma0 Std	BT Min	BT Max	BT Mean	BT Std
Amazon_3	-6.00	-61.00	Inner	ASC	Aft	-9.91	-7.45	-8.77	0.59	248.04	346.18	297.29	20.37
Amazon_3	-6.00	-61.00	Inner	ASC	Fore	-9.58	-7.46	-8.52	0.61	253.38	335.95	298.30	16.78
Amazon_2	-3.00	-61.00	Inner	ASC	Aft	-12.84	-7.77	-9.32	1.03	192.43	336.43	277.93	25.78
Amazon_2	-3.00	-61.00	Inner	ASC	Fore	-12.90	-6.66	-9.38	1.09	226.99	319.98	275.89	23.90
Amazon_1	0.00	-67.00	Inner	ASC	Aft	-9.51	-6.82	-8.12	0.62	307.30	428.06	356.17	23.95
Amazon_1	0.00	-67.00	Inner	ASC	Fore	-9.50	-6.81	-7.96	0.55	287.49	355.62	315.81	17.86
Amazon_3	-6.00	-61.00	Outer	ASC	Aft	-10.48	-9.06	-9.65	0.38	251.77	356.38	296.02	22.70
Amazon_3	-6.00	-61.00	Outer	ASC	Fore	-9.84	-8.50	-9.00	0.37	260.43	325.69	291.77	17.30
Amazon_2	-3.00	-61.00	Outer	ASC	Aft	-12.40	-8.59	-10.29	0.92	257.40	330.85	283.49	17.43
Amazon_2	-3.00	-61.00	Outer	ASC	Fore	-11.50	-8.65	-9.86	0.80	244.56	325.83	281.24	19.59
Amazon_1	0.00	-67.00	Outer	ASC	Aft	-9.55	-7.91	-8.84	0.41	267.41	331.96	302.27	15.07
Amazon_1	0.00	-67.00	Outer	ASC	Fore	-9.91	-7.90	-8.61	0.45	281.61	335.15	303.63	12.55



## 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	256.67	0.29	2.104	0.12	226.00	0.25	1.860	0.12	16.75	0.12	0.032	0.12	5.69	0.12	0.010
<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>	-34.23	24.96	6.73	2.323	-33.68	26.22	8.71	5.015	-22.35	28.29	20.11	14.947	-17.62	30.37	20.60	24.648

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	204.28	0.23	1.611	0.09	199.65	0.20	1.270	0.09	64.16	0.09	0.007	0.09	3.46	0.09	0.005
<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>	-34.40	21.54	4.03	0.000	-34.31	21.74	5.49	0.000	-29.37	23.32	14.44	0.042	-16.61	22.94	14.59	0.023

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	49.30	49.01	0.000	57.45	58.11	57.84	0.000	Inci.(Inner)	47.10	49.90
<b>Azimuth Diff. (deg)</b>	0.0000	102.25	1.27	2.798	0.0000	296.77	1.27	4.049	Inci.(Outer)	57.30	58.90
<b>Range(Km)</b>	1020.21	1071.42	1041.06	18.313	1194.75	1258.06	1221.23	38.112	Azimuth Diff.	0.60	2.00
<b>X Factor(dbm)</b>	-91.44	-89.73	-90.31	0.000	-92.72	-91.78	-92.12	0.000	Range(Inner)	1025.00	1095.70
<b>Across Distance (Km)</b>	15.59	16.16	15.85	0.000	11.25	54.51	20.98	6.000	Range(Outer)	1210.00	1280.00
<b>Along Distance (Km)</b>	19.00	11174.93	72.82	6.000	4.78	11384.38	42.00	6.000	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

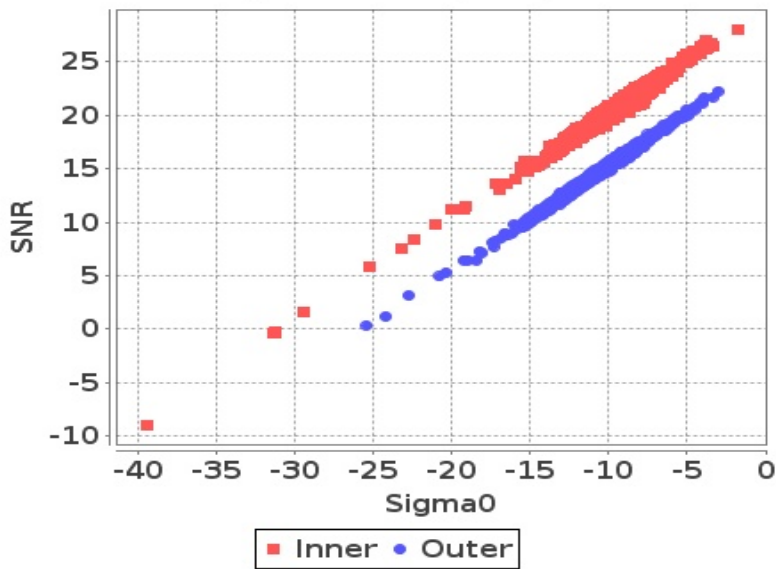
- Normal
- Deviations
- Alarming
- High Errors



## Sigma0 Behaviour (Sigma0 Vs SNR)

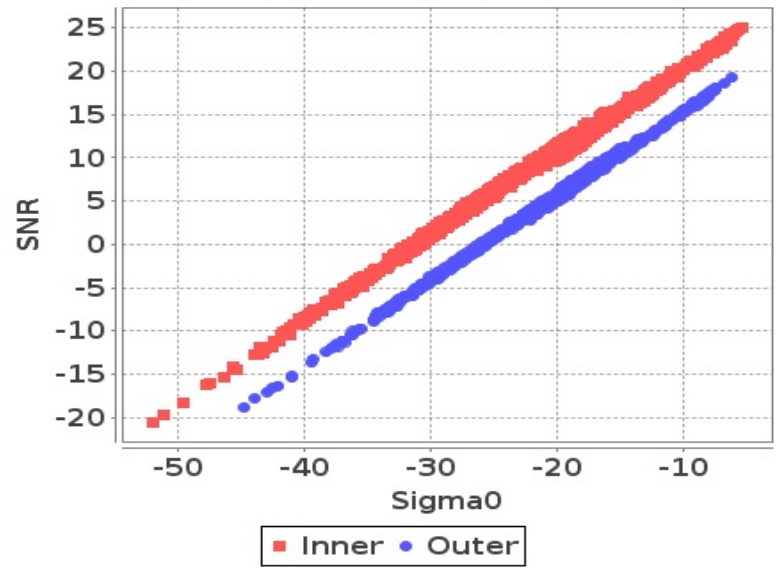
**Footprint-Land**

Sigma0 Vs SNR (Land)



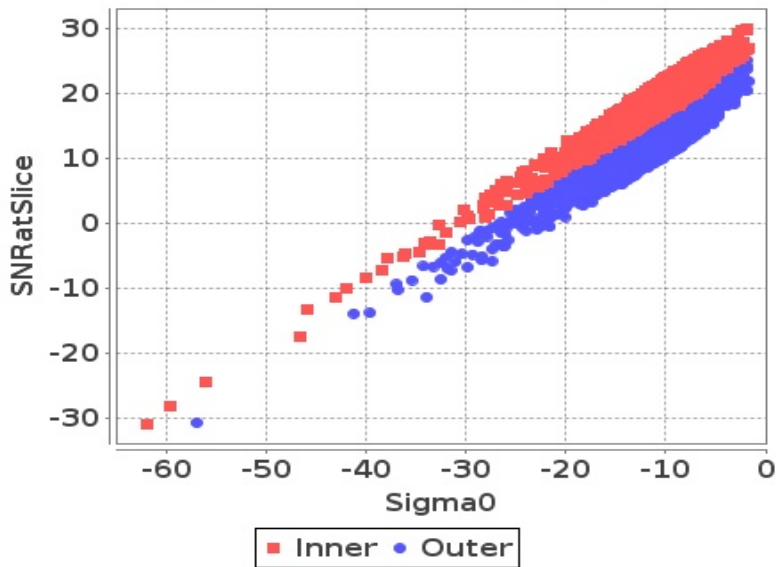
**Footprint-Sea**

Sigma0 Vs SNR (Sea)



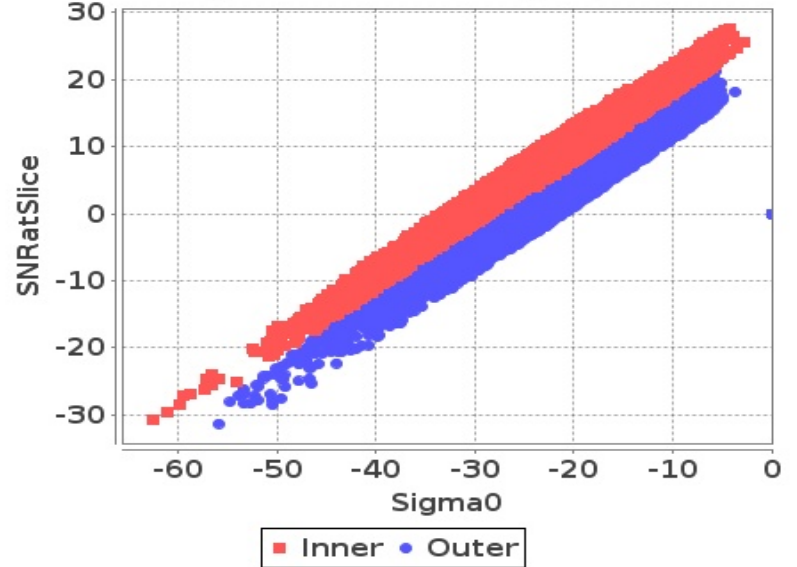
**Slice-Land**

Sigma0 Vs SNRatSlice (Land)



**Slice-Sea**

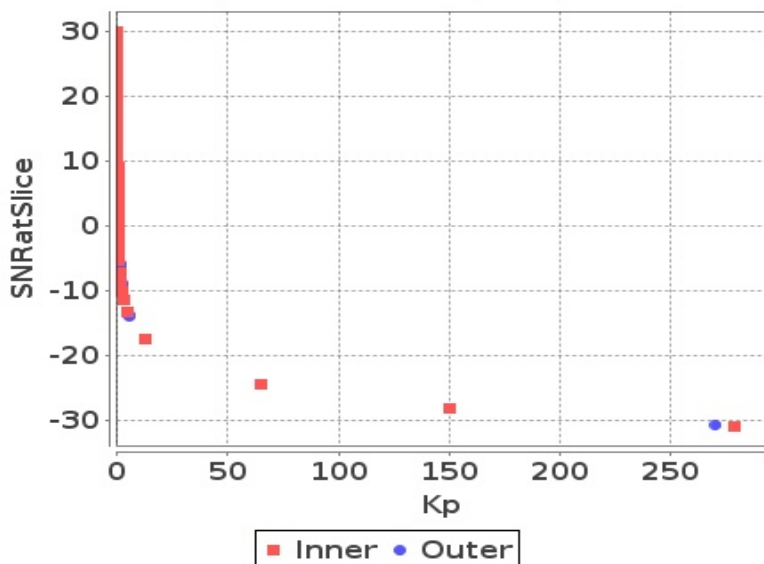
Sigma0 Vs SNRatSlice (Sea)



## Sigma0 Behaviour (Kp Vs SNR)

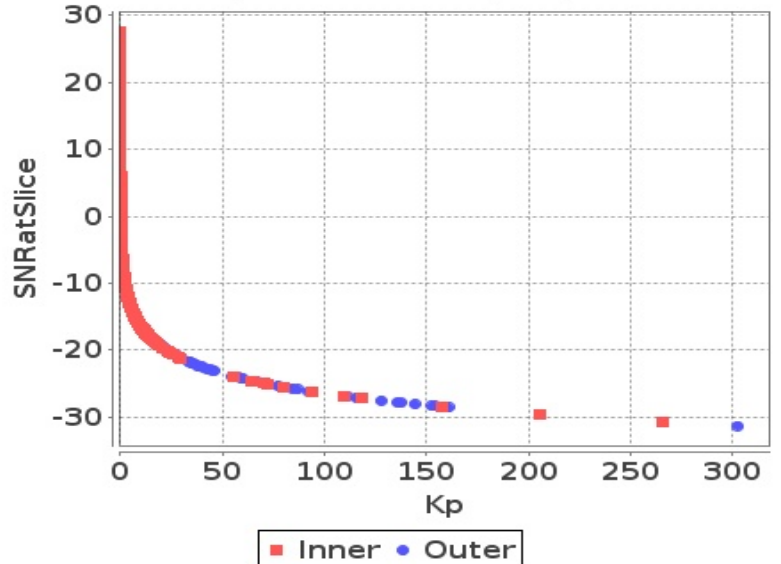
**Slice**

Kp Vs SNRatSlice (Land)



**Slice**

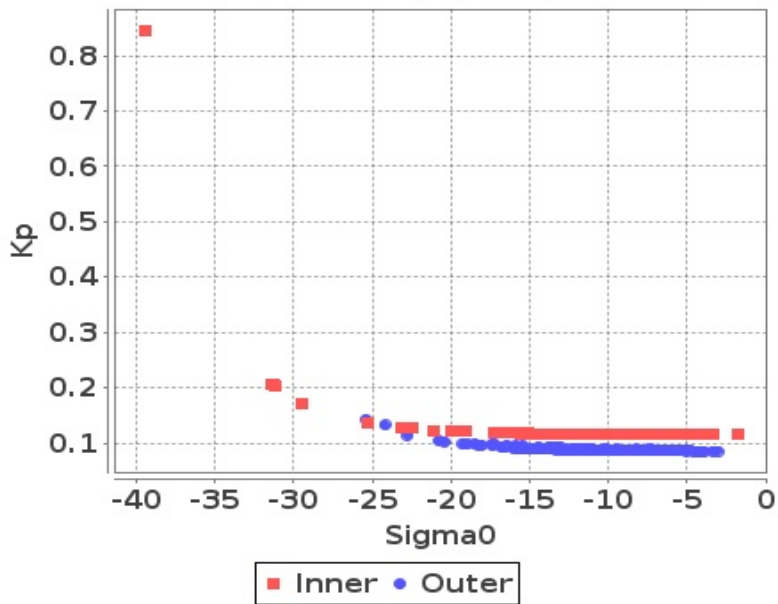
Kp Vs SNRatSlice (Sea)



# Sigma0 Behaviour(Sigma0 Vs Kp)

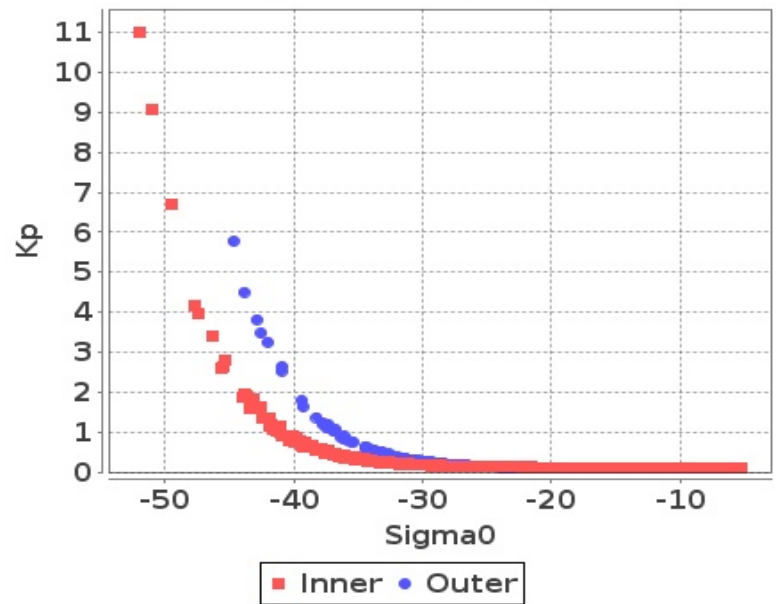
## Footprint-Land

### Sigma0 Vs Kp (Land)



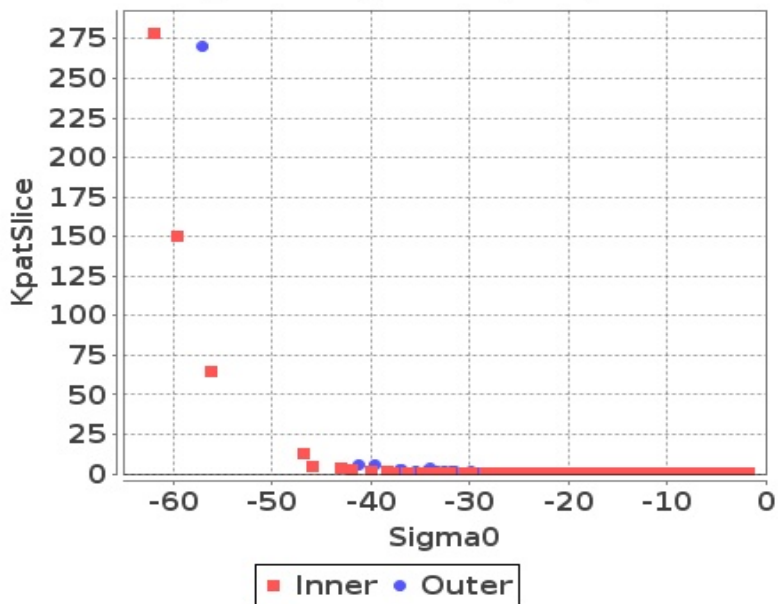
## Footprint-Sea

### Sigma0 Vs Kp (Sea)



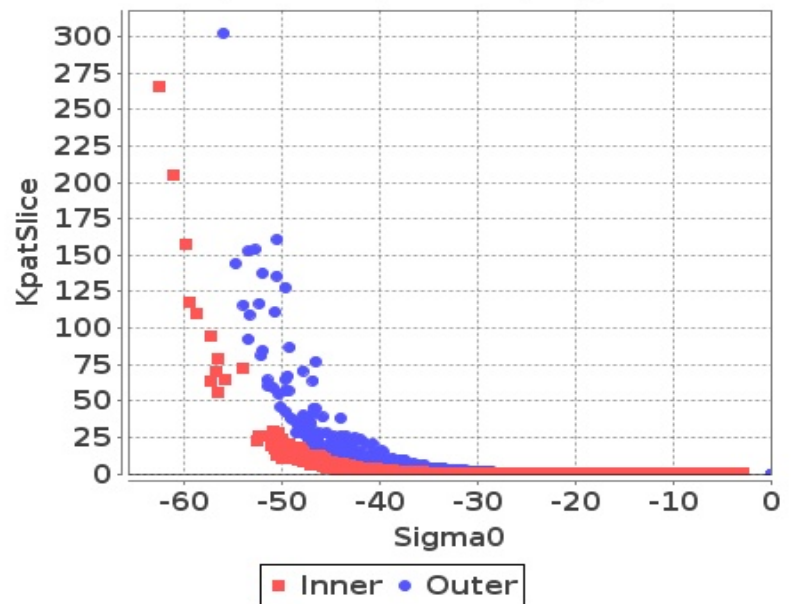
## Slice-Land

### Sigma0 Vs KpatSlice (Land)



## Slice-Sea

### Sigma0 Vs KpatSlice (Sea)



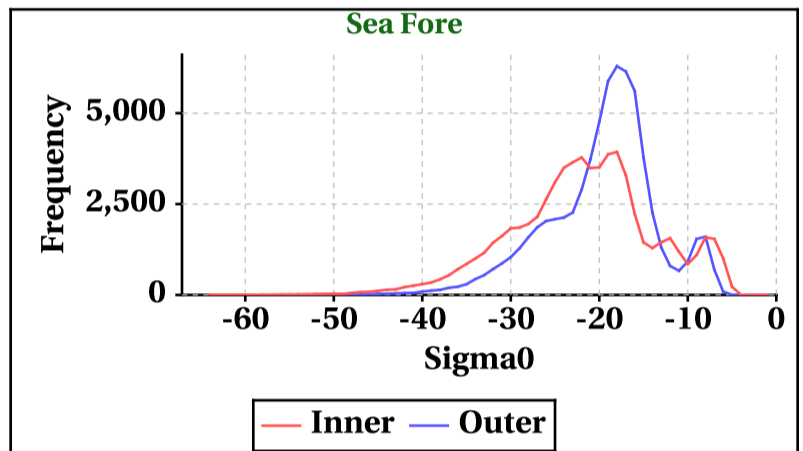
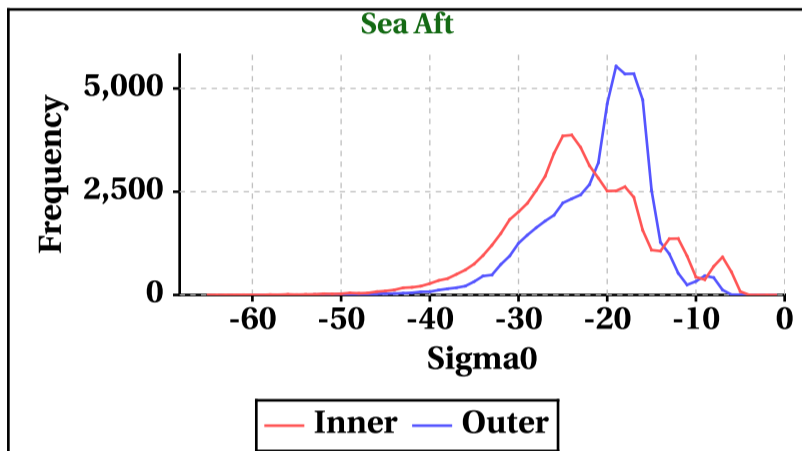
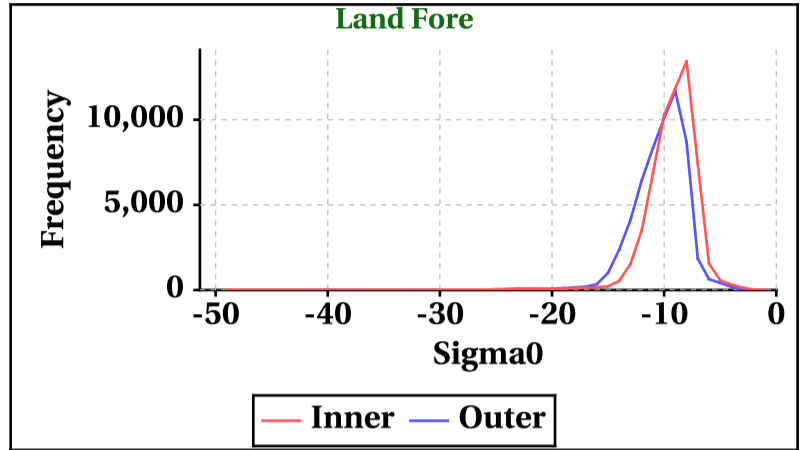
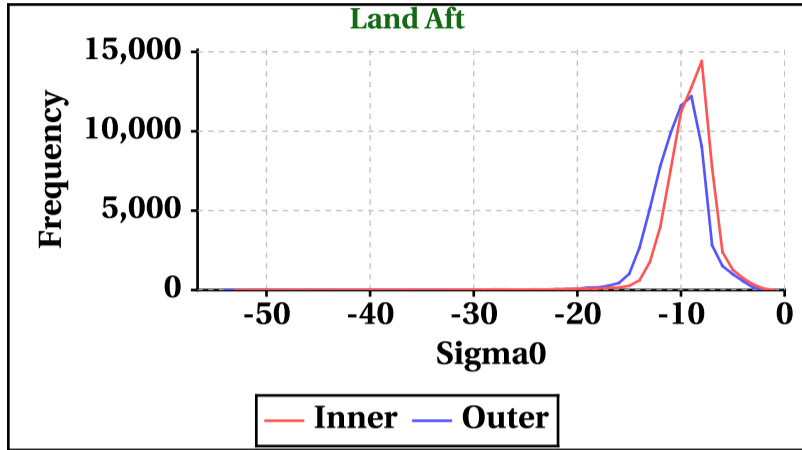


# Dynamic Range (Data Histograms)

## Sigma0(db)

Inner Beam (HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-53	-49	-65	-64
Max	0	0	0	0

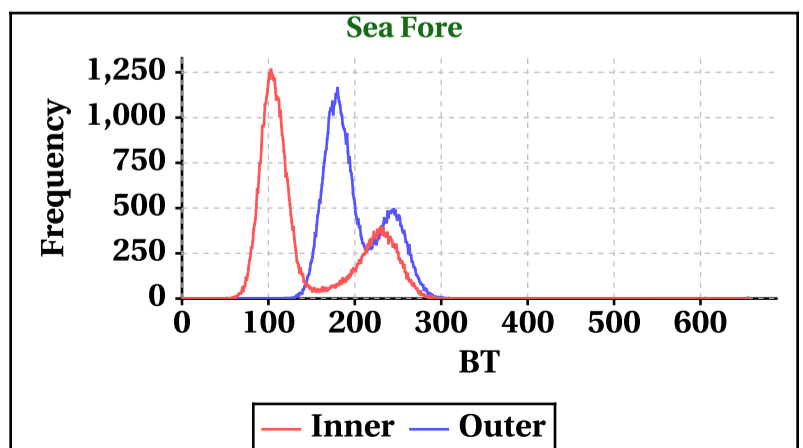
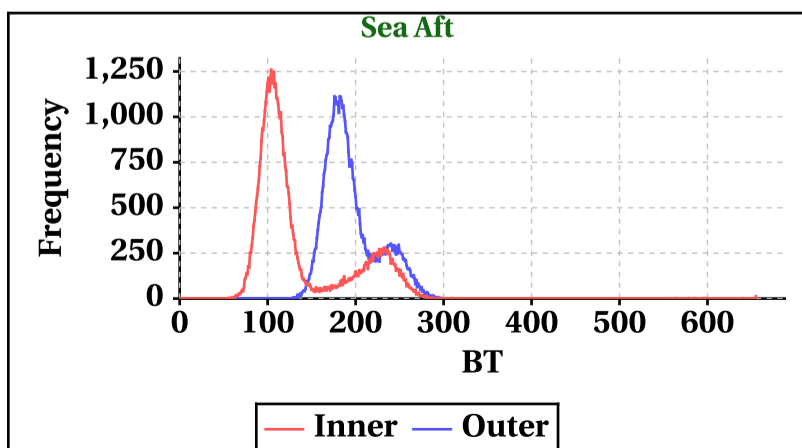
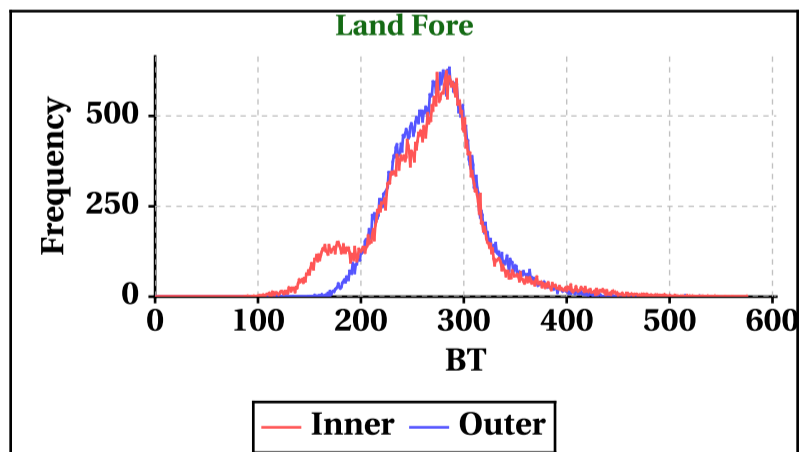
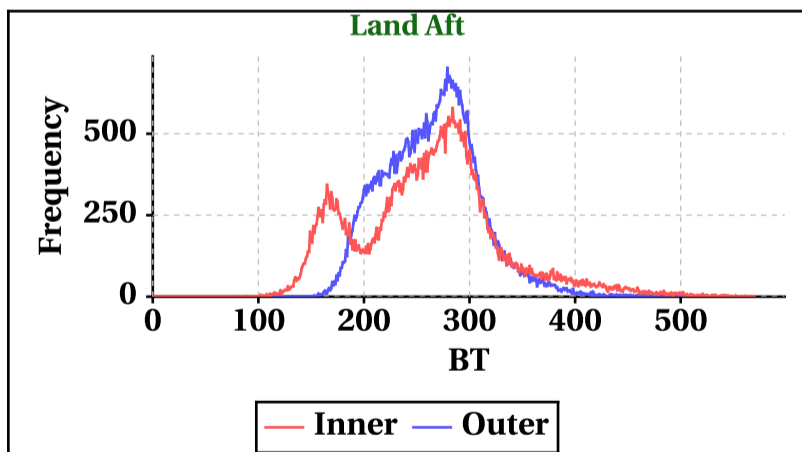
Outer Beam (VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-54	-42	-60	-60
Max	0	0	0	0



## Brightness Temperature(K)

Inner Beam(HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	0	0
Max	570	575	655	655

Outer Beam(VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	0	0
Max	545	540	619	655

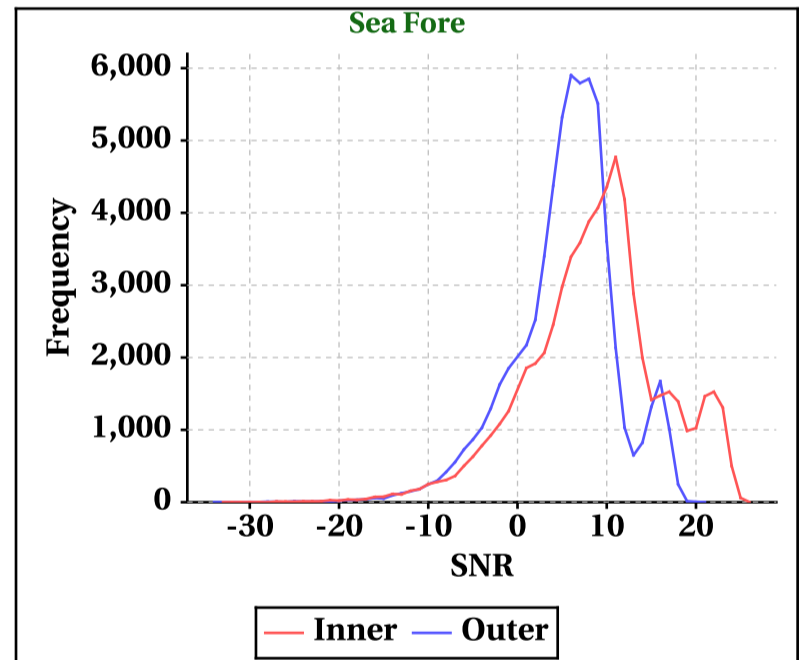
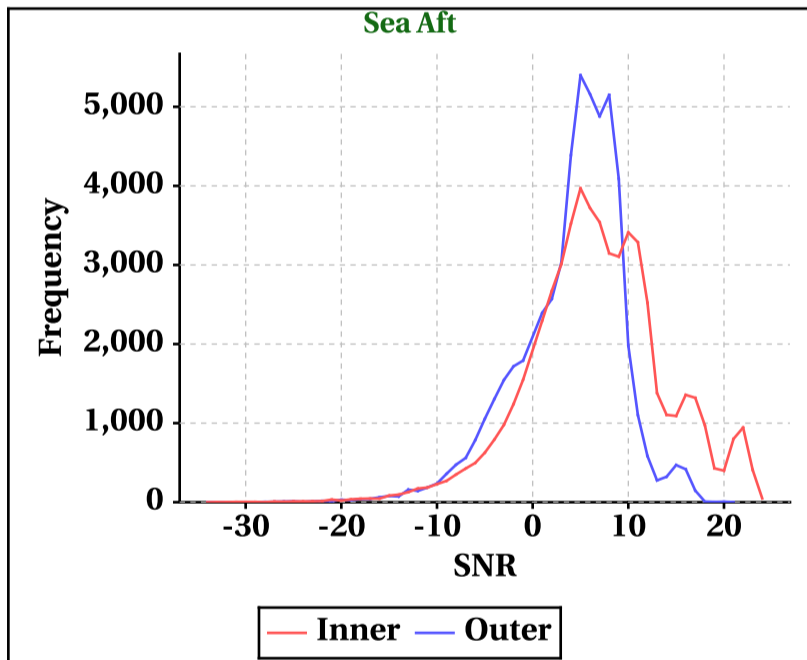
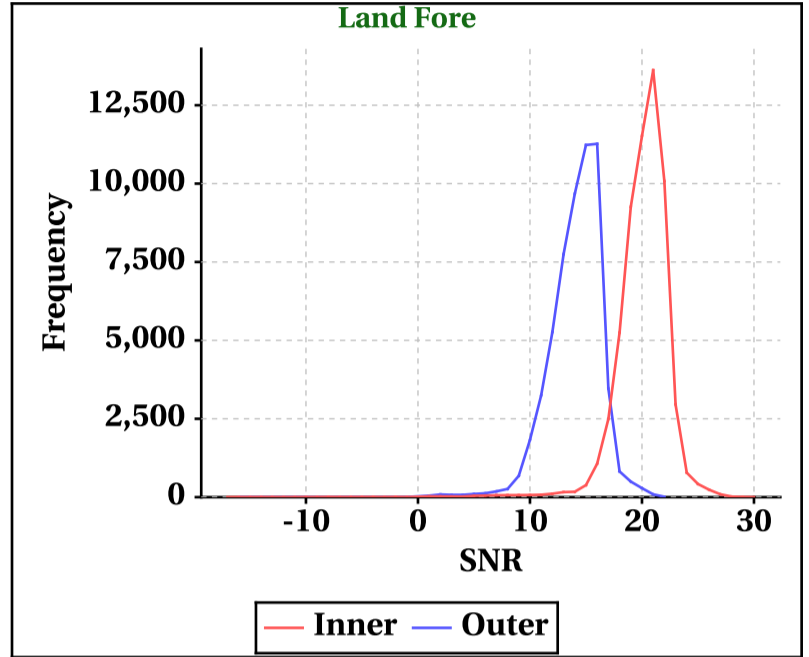
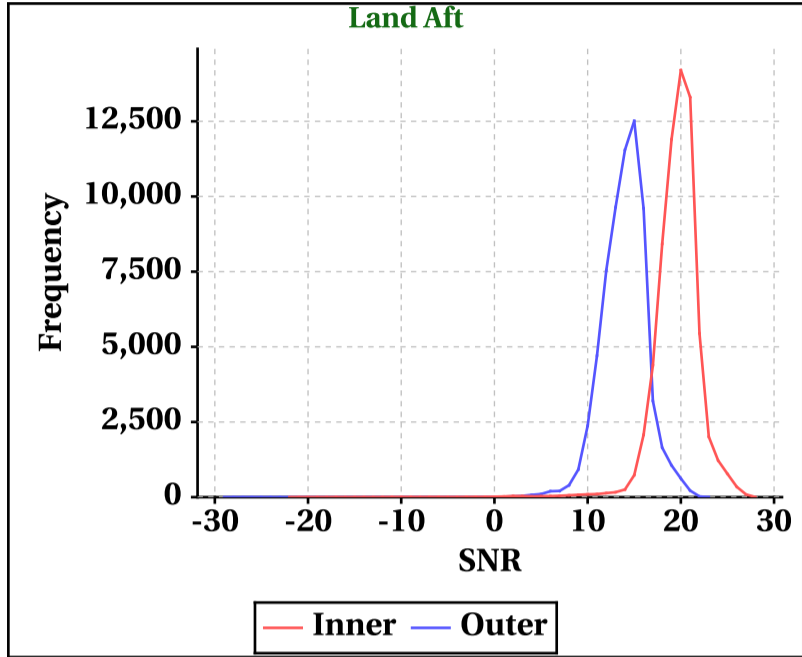


# Dynamic Range (Data Histograms)

## SNR(dBm)

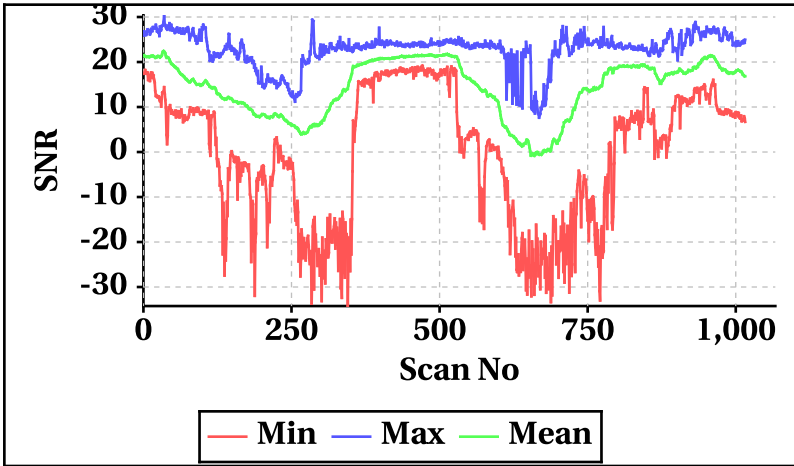
Inner Beam (HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-22	-17	-34	-33
Max	28	30	24	26

Outer Beam (VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-29	-16	-34	-34
Max	23	22	21	21

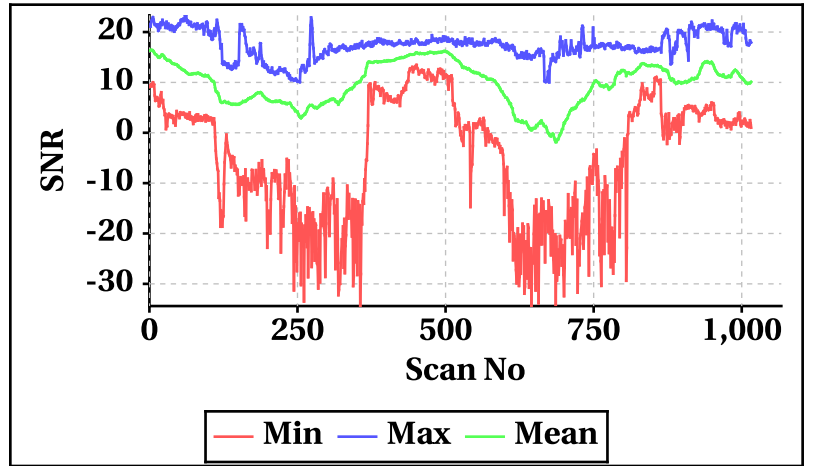


## Orbit-wise behaviour of SNR

Inner Beam (HH)

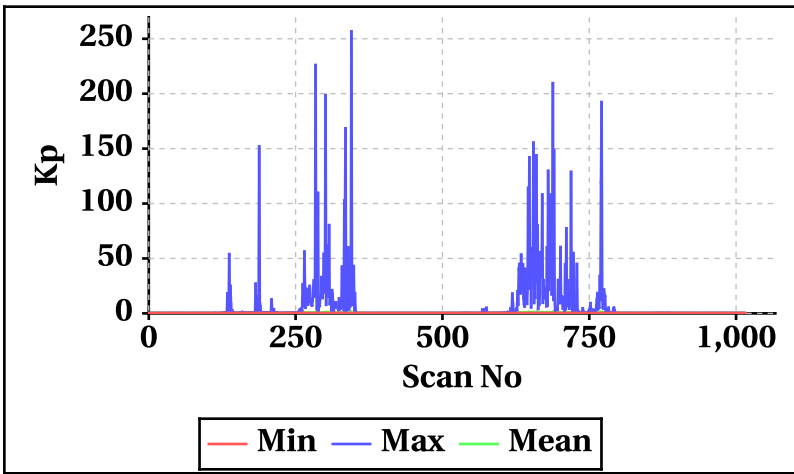


Outer Beam(VV)

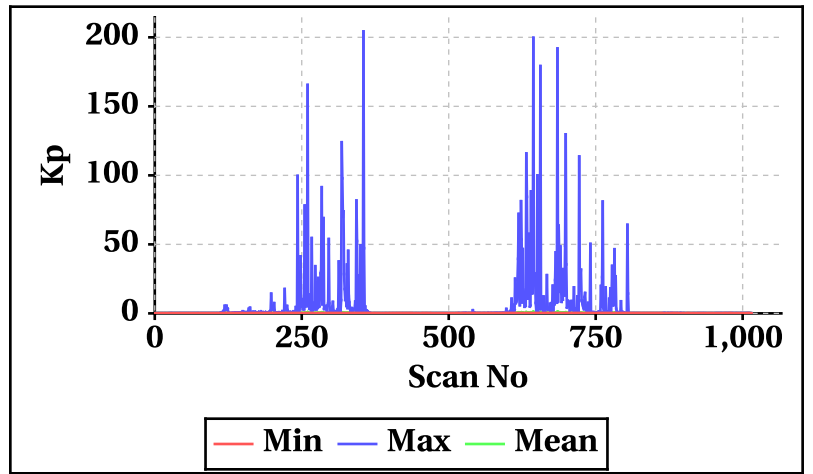


## Orbit-wise behaviour of Kp,Kpa,Kpb,Kpc

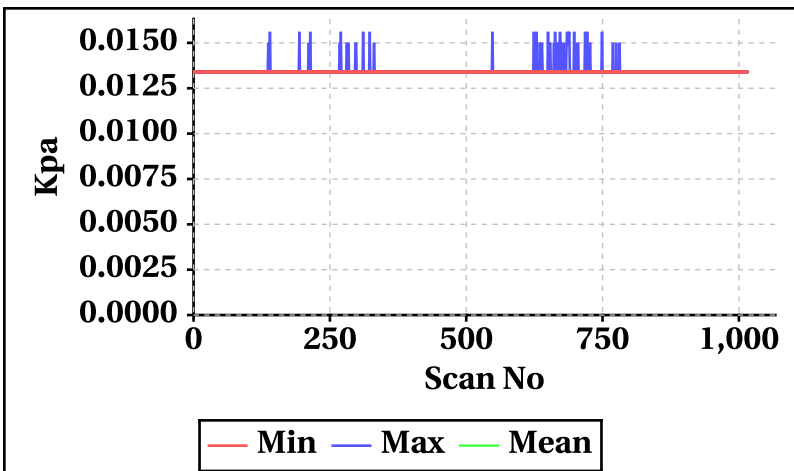
Inner Beam(HH)



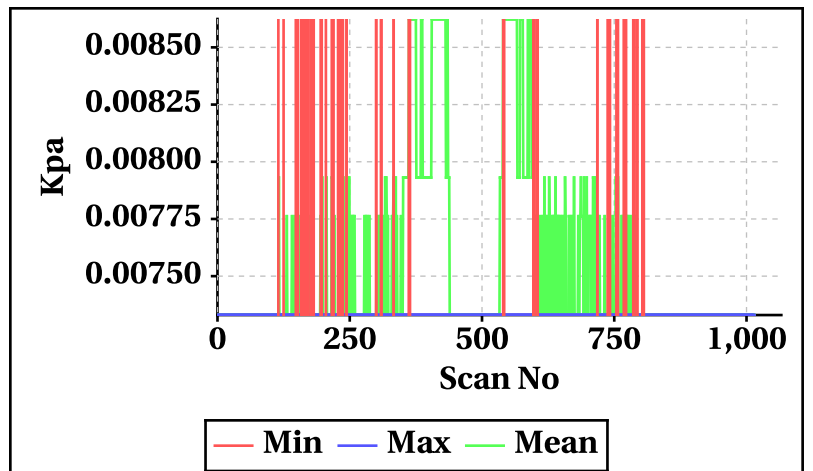
Outer Beam(VV)



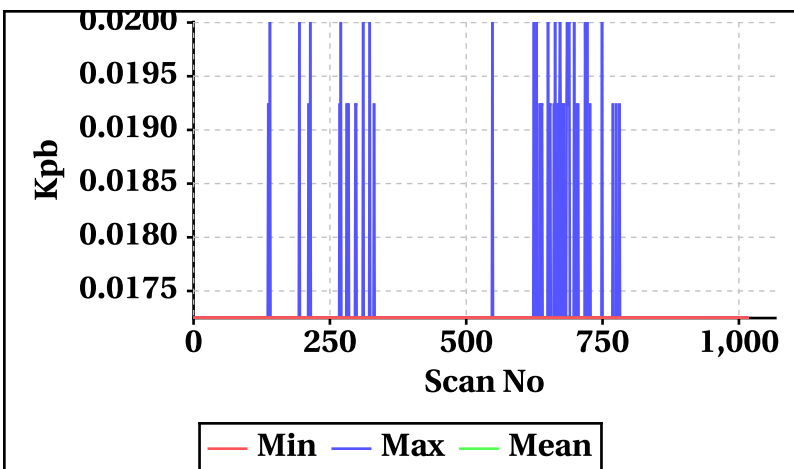
Inner Beam(HH)



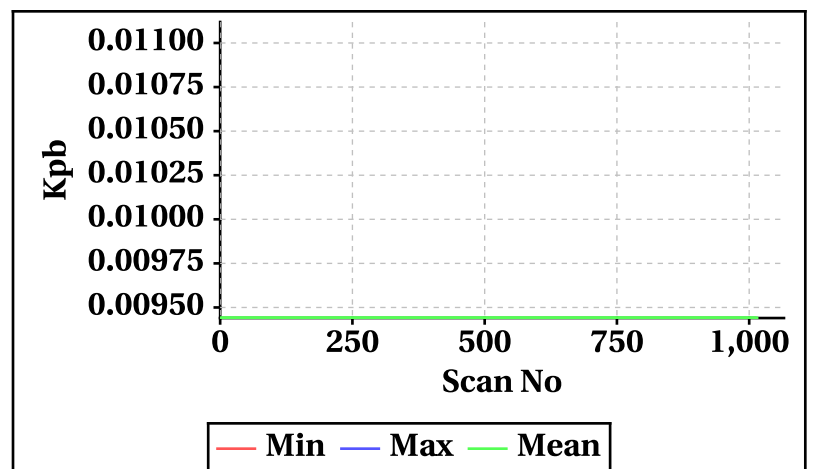
Outer Beam(VV)



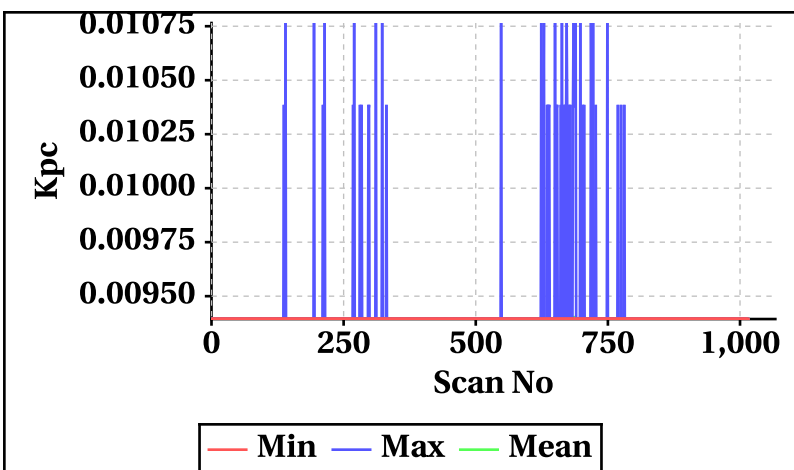
Inner Beam(HH)



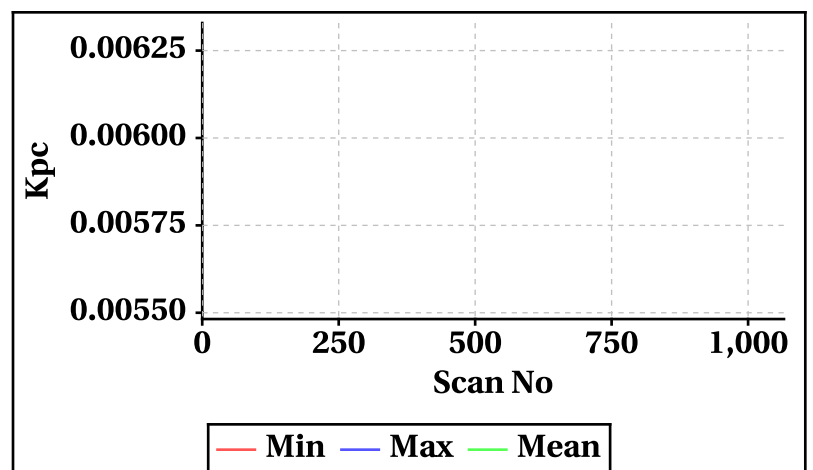
Outer Beam(VV)



Inner Beam(HH)



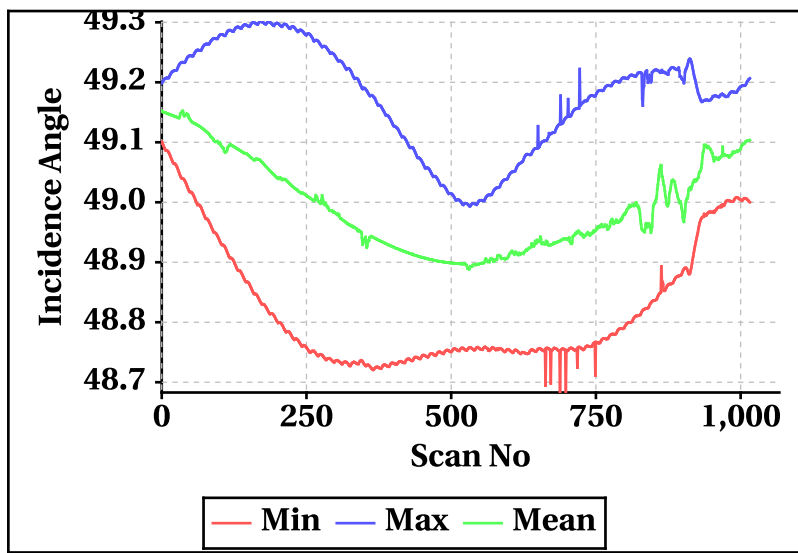
Outer Beam(VV)



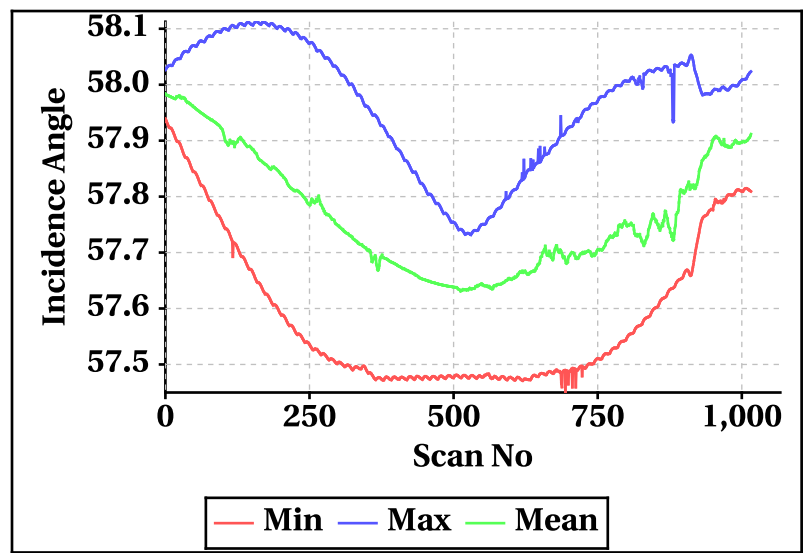


Orbit-wise behaviour of Incidence, Azimuth, Range, X-Factor

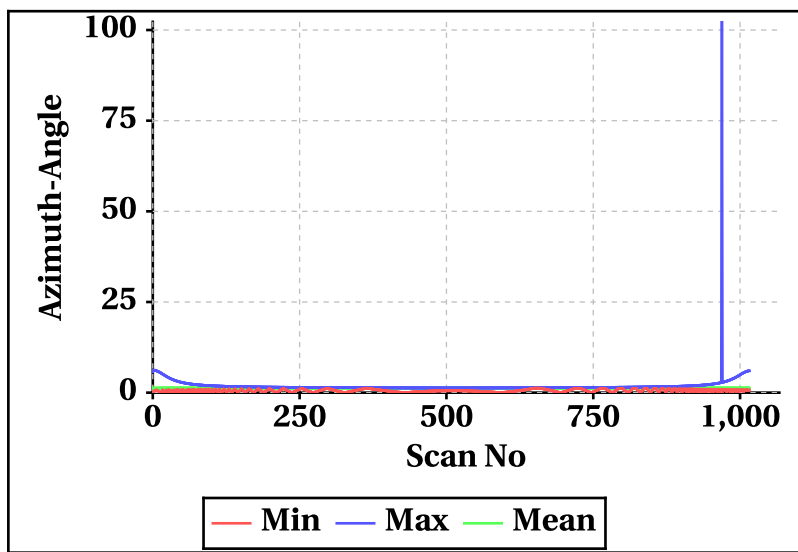
Inner Beam (HH)



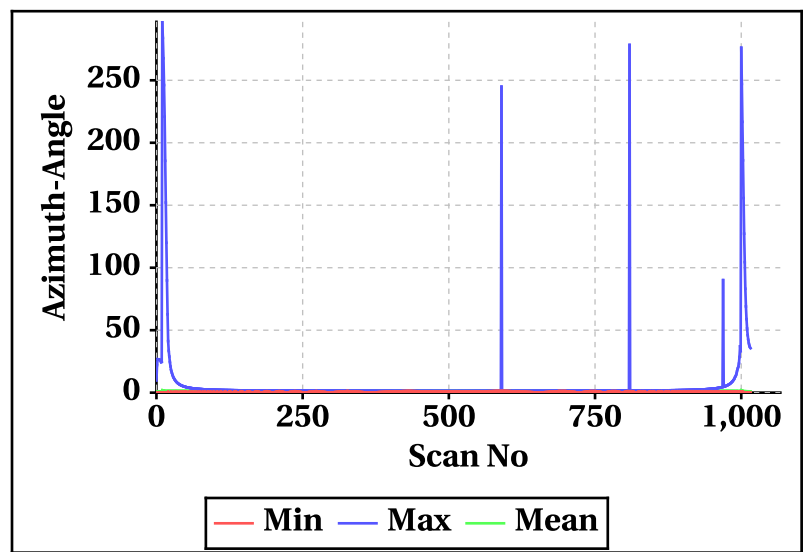
Outer Beam(VV)



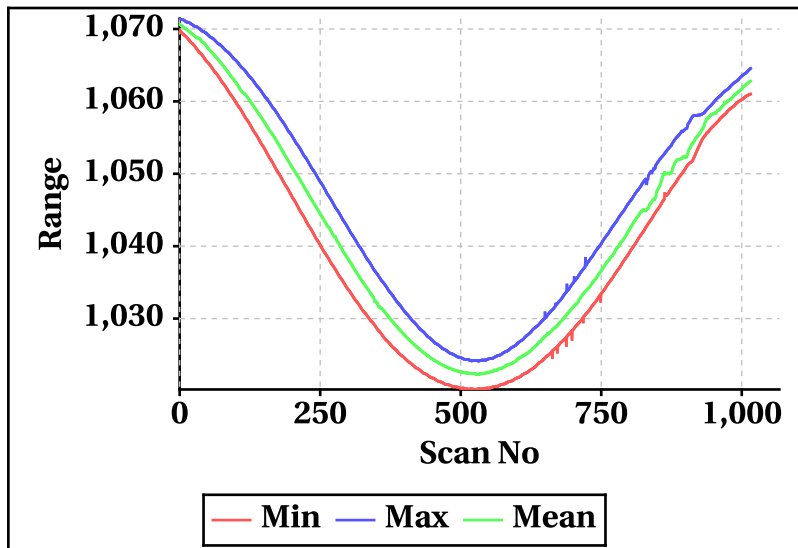
Inner Beam (HH)



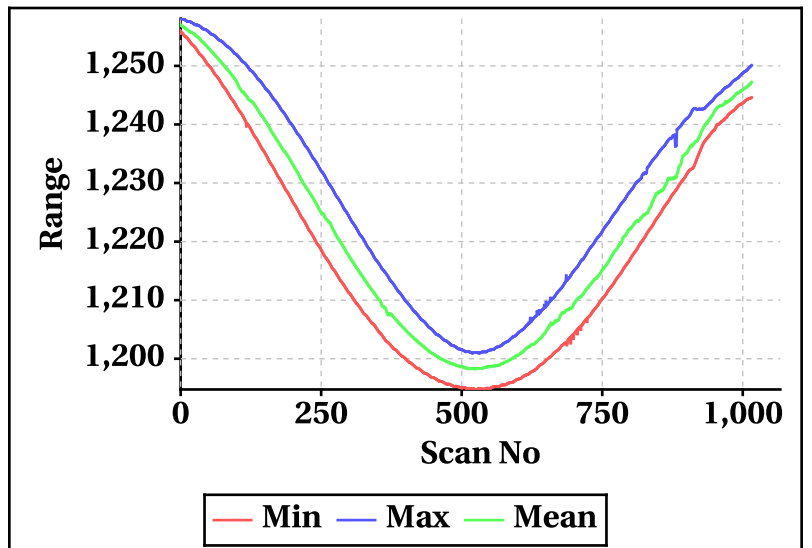
Outer Beam(VV)



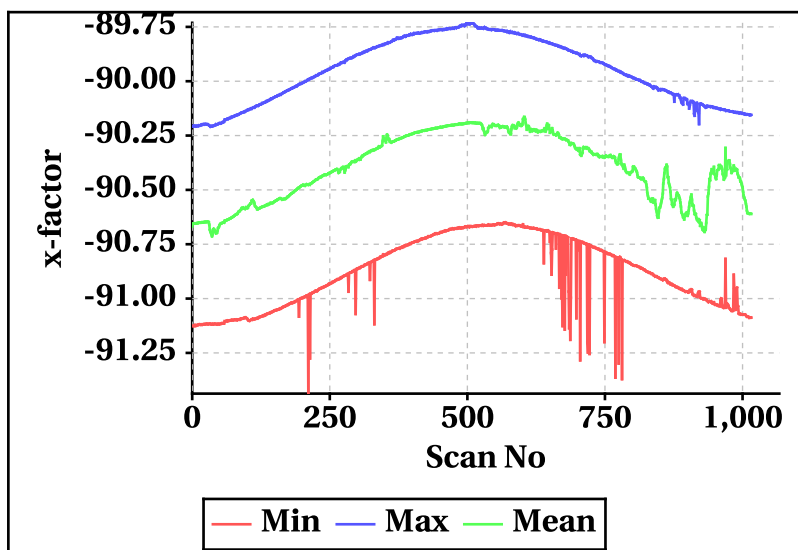
Inner Beam (HH)



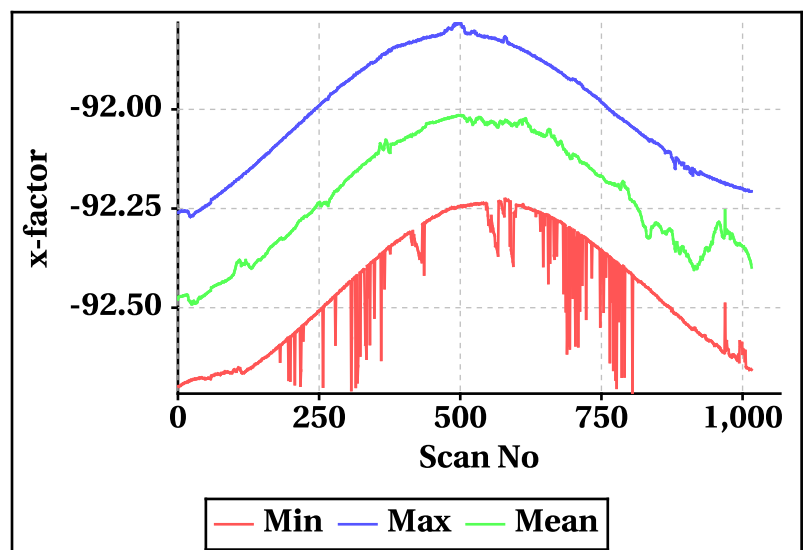
Outer Beam(VV)



Inner Beam (HH)



Outer Beam(VV)

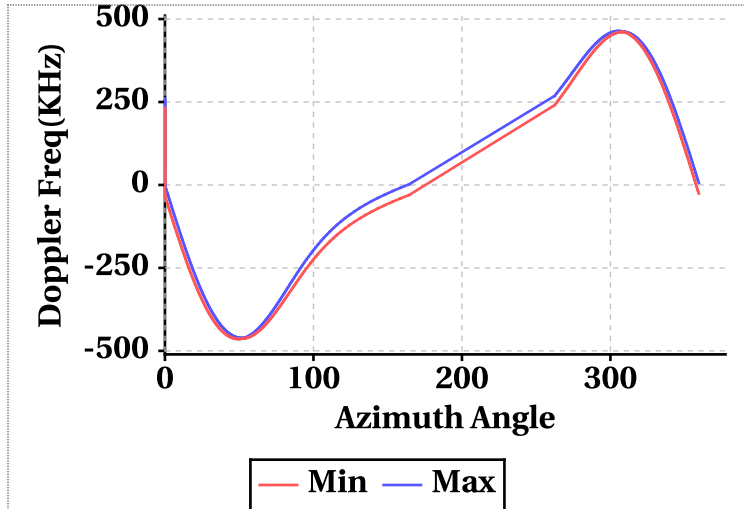


# Doppler Frequency Variation

**Doppler Frequency(KHz) variation statistics Over the half Orbit**

	Inner Beam (HH)	Outer Beam (VV)
<b>Min</b>	-464.22	-520.20
<b>Max</b>	463.82	519.84

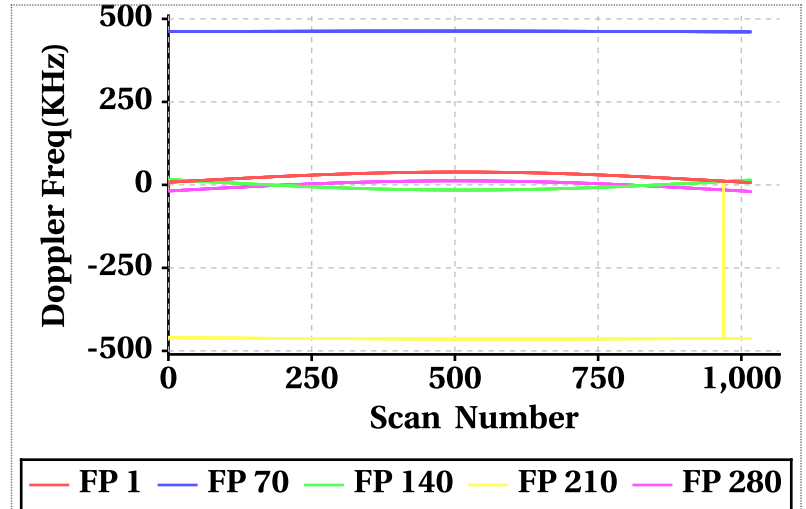
**Footprint wise Doppler frequency variation Inner Beam (HH)**



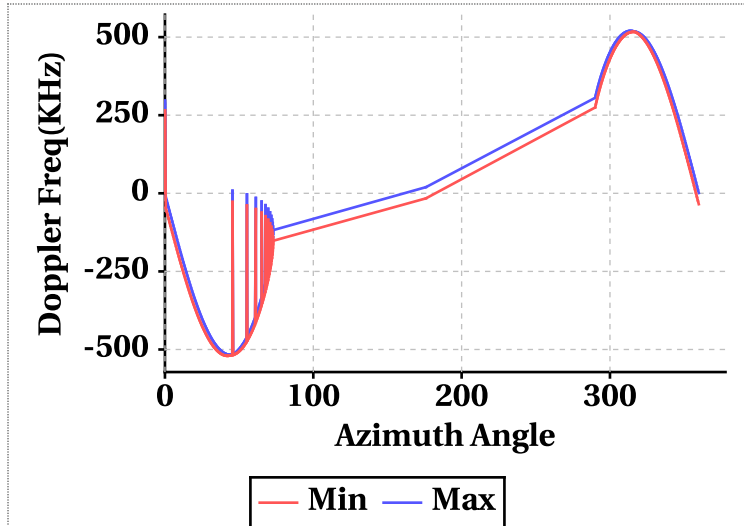
**Doppler Frequency(KHz) variation**

Doppler_FP	Inner Beam (HH)			Outer Beam (VV)		
	Min	Max	Mean	Min	Max	Mean
Doppler_1	0.00	38.70	27.26	-19.88	37.76	24.94
Doppler_70	460.74	463.32	462.54	516.50	519.52	518.53
Doppler_140	-15.56	16.38	-4.22	-23.28	12.40	-10.55
Doppler_210	-464.16	6.14	-462.65	-519.98	7.22	-518.45
Doppler_280	-19.88	12.30	0.84	-16.16	19.72	6.86

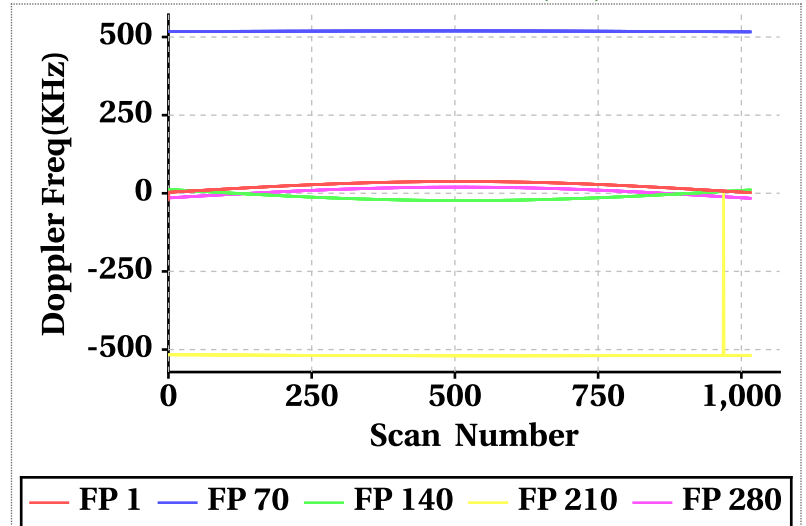
**Doppler frequency variation at footprints: 1, 70, 140, 210 & 280 Inner Beam (HH)**



**Footprint wise Doppler frequency variation Outer Beam (VV)**

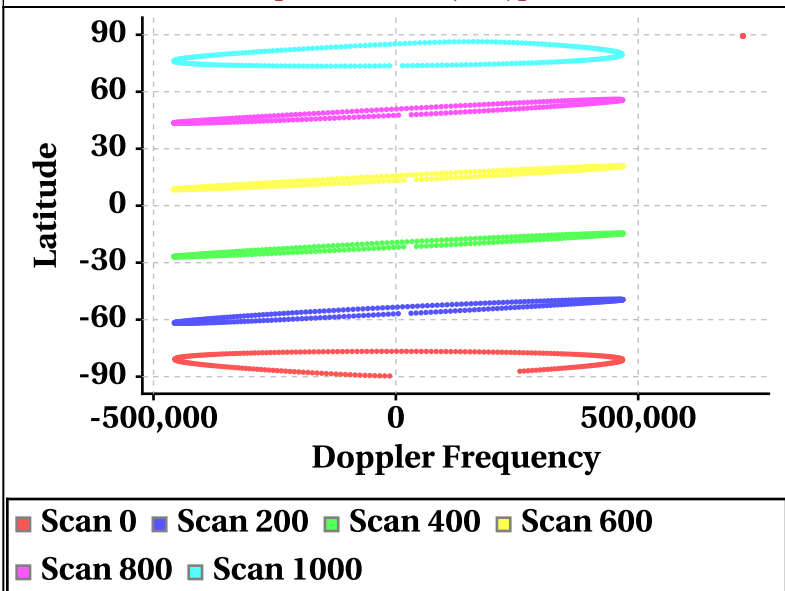


**Doppler frequency variation at footprints: 1, 70, 140, 210 & 280 Outer Beam (VV)**

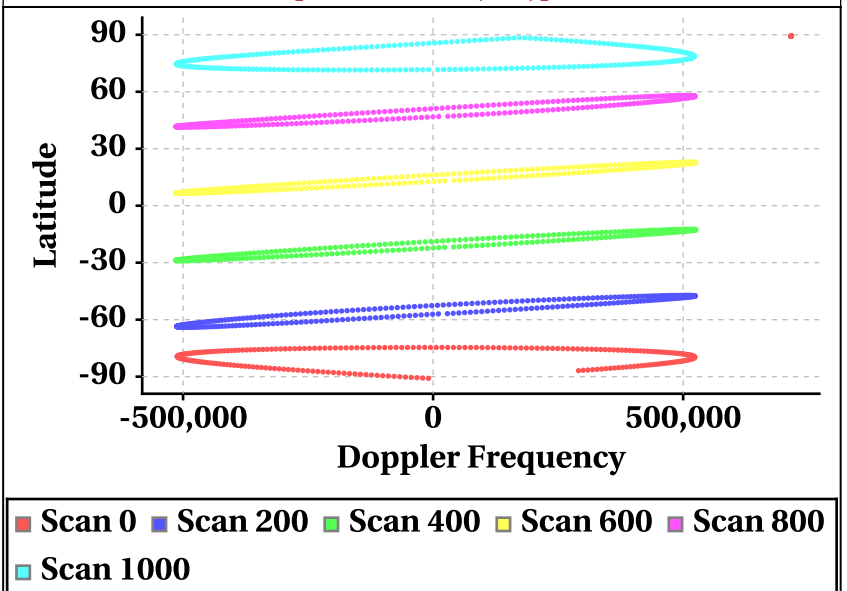


# Latitude Vs Doppler Frequency

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



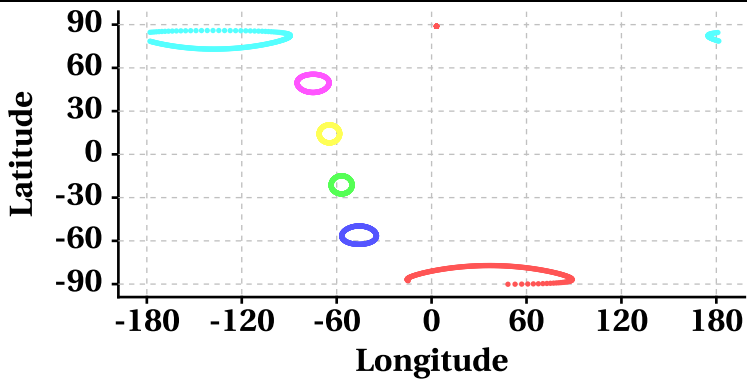
**Doppler Frequency at Scan Interval of 200 [Outer Beam(VV)]**



# Parameter as a function of Latitude

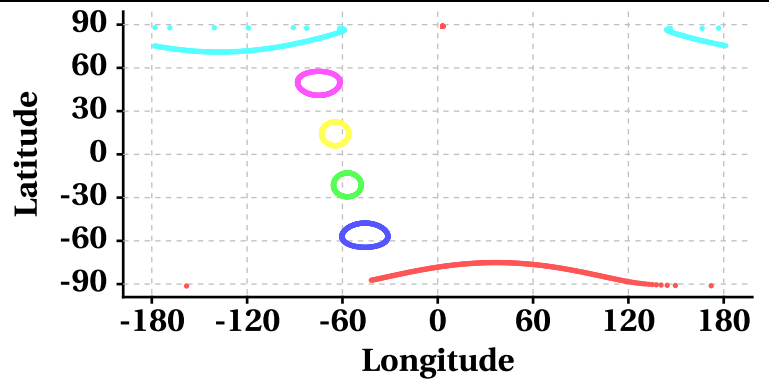
## Latitude Vs Longitude

Scan Trace [Inner Beam(HH)]



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

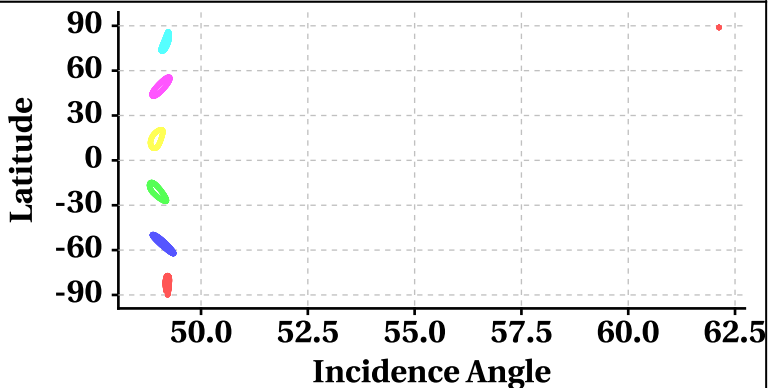
Scan Trace [Outer Beam (VV)]



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

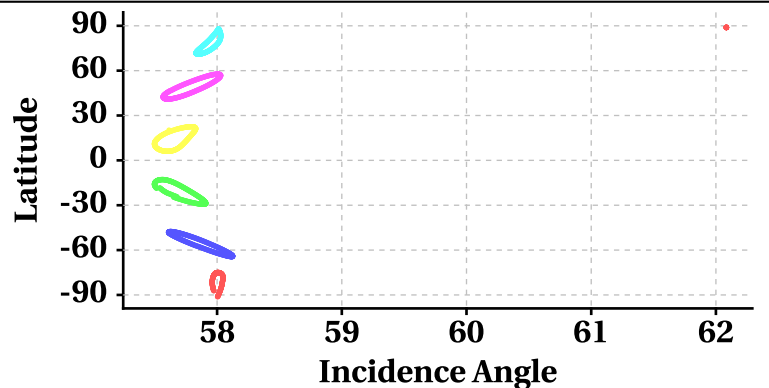
## Latitude Vs Incidence Angle

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



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

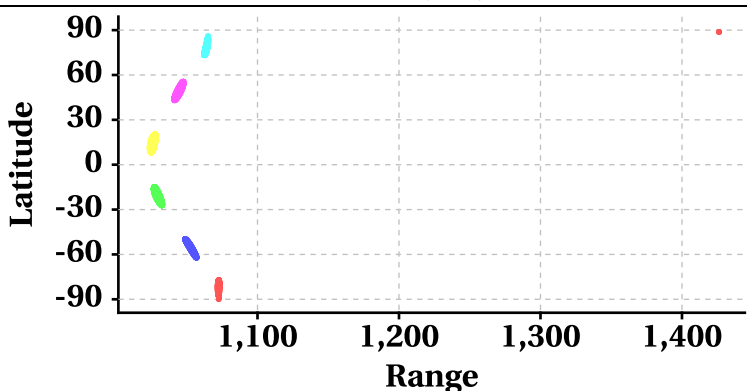
Incidence Angle at Scan Interval of 200 [Outer Beam (VV)]



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

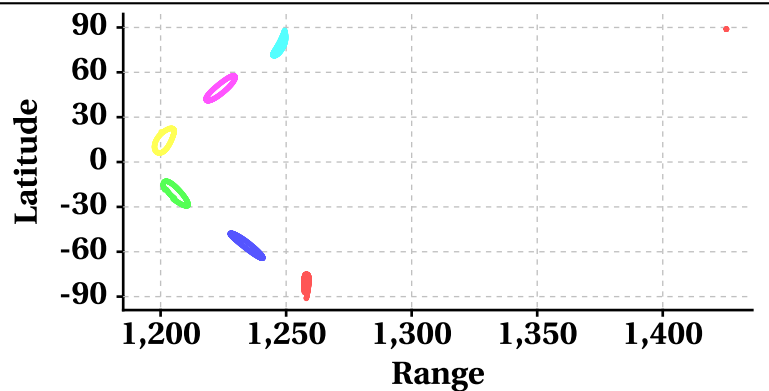
## Latitude Vs Range

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

