

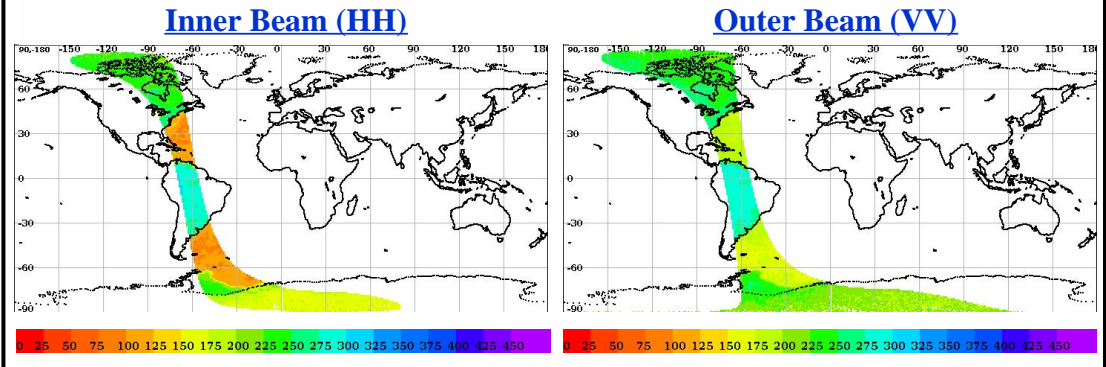
# SCATSAT-1 Scatterometer Level-1B Data Quality Evaluation Report

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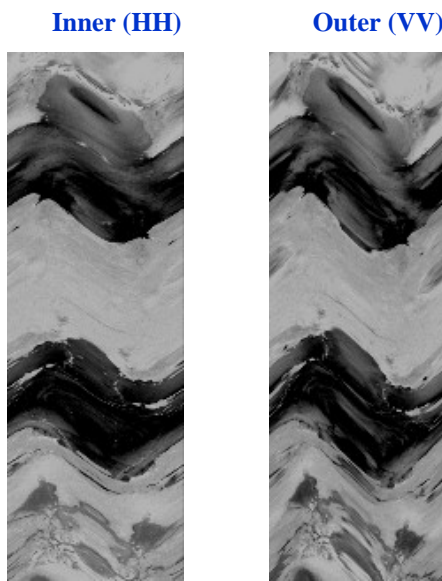
- Half-Orbit Coverage using BT & Sigma-0
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<b>Satellite Id</b>	ScatSat-1	<b>Start Orbit</b>	13293	<b>Total Scans</b>	956
<b>Sensor Name</b>	Scatterometer	<b>End Orbit</b>	13294	<b>No of Inner FootPrints</b>	281
<b>Processor Version</b>	v1.1.3	<b>Rev. Number</b>	13293_13294	<b>No Of Outer FootPrints</b>	282
<b>Half Orbit Direction</b>	SN	<b>Data Production Date</b>	01-04-2019	<b>No. Of Inner Slices</b>	9
<b>Equator Crossing Date</b>	01-04-2019	<b>Equator Crossing Time</b>	00:46:06.000	<b>No Of Outer Slices</b>	15

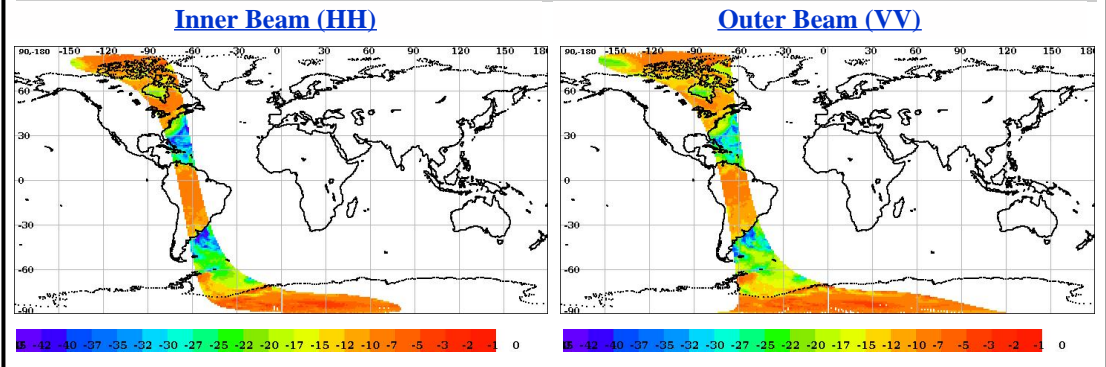
## Brightness Temperature(k) Footprint trace



## Image Snapshot for Inner & Outer Beam



## Sigma0(dB) Footprint trace



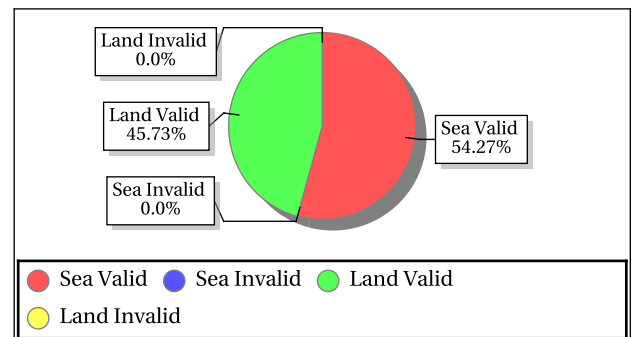
## Invalid and Poor Sigma-0 Quality Flag Statistics for Inner/Outer Slices\*

Sigma-0 Flags	Inner Beam	Outer Beam
Invalid Sigma0(%)	0.00	0.00
Data Not Available From Payload (%)	0.0	30.61224
Slice not within sample array limits (%)	0.00	69.39
C(S+N) - C(N) < 0.1 (%)	0.00	0.00
Poor Sigma0(%)	22.23	13.34
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 (%)	0.031449	0.062657

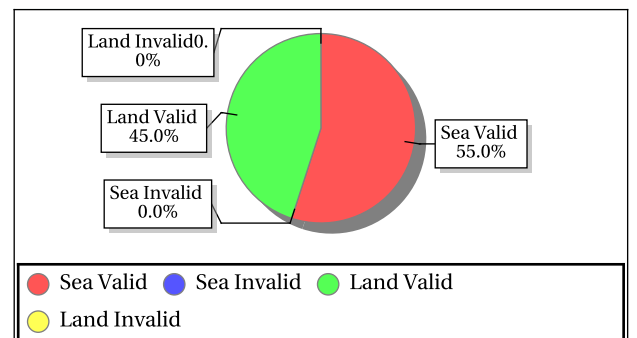
\*DP Format Document

## 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	-10.87	-7.41	-8.78	0.71	253.86	344.79	288.45	17.56
Amazon_3	-6.00	-61.00	Inner	ASC	Fore	-9.48	-6.99	-8.18	0.62	255.69	335.19	287.12	17.18
Amazon_2	-3.00	-61.00	Inner	ASC	Aft	-12.83	-7.08	-9.13	1.13	200.32	311.08	262.34	25.04
Amazon_2	-3.00	-61.00	Inner	ASC	Fore	-12.32	-7.00	-8.93	1.15	206.56	313.34	258.80	27.99
Amazon_1	0.00	-67.00	Inner	ASC	Aft	-10.33	-7.13	-8.24	0.64	258.75	319.90	296.82	13.56
Amazon_1	0.00	-67.00	Inner	ASC	Fore	-9.45	-6.63	-8.03	0.66	257.53	331.51	298.30	17.78
Amazon_3	-6.00	-61.00	Outer	ASC	Aft	-10.51	-9.24	-9.85	0.34	244.01	311.56	283.89	14.77
Amazon_3	-6.00	-61.00	Outer	ASC	Fore	-10.43	-8.43	-9.39	0.47	243.69	330.54	285.41	18.24
Amazon_2	-3.00	-61.00	Outer	ASC	Aft	-12.89	-8.58	-10.24	0.97	233.92	297.68	272.58	16.39
Amazon_2	-3.00	-61.00	Outer	ASC	Fore	-11.76	-8.90	-10.17	0.77	240.77	317.89	274.69	20.22
Amazon_1	0.00	-67.00	Outer	ASC	Aft	-9.99	-8.03	-9.12	0.43	243.09	334.46	286.89	17.72
Amazon_1	0.00	-67.00	Outer	ASC	Fore	-9.56	-8.06	-8.81	0.37	253.93	330.13	296.01	19.16



## 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	263.49	0.44	4.638	0.12	226.27	0.36	3.495	0.12	0.67	0.12	0.000	0.12	0.46	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>	-34.34	26.90	4.68	1.078	-33.68	26.18	6.30	3.187	-7.73	29.25	20.33	16.757	-5.73	30.47	20.80	26.911

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	193.67	0.36	4.142	0.09	210.33	0.33	3.438	0.09	0.30	0.09	0.000	0.09	0.24	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>	-34.17	22.13	2.35	0.002	-34.53	21.30	3.28	0.000	-4.88	23.01	14.57	0.066	-3.57	23.40	14.74	0.066

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)

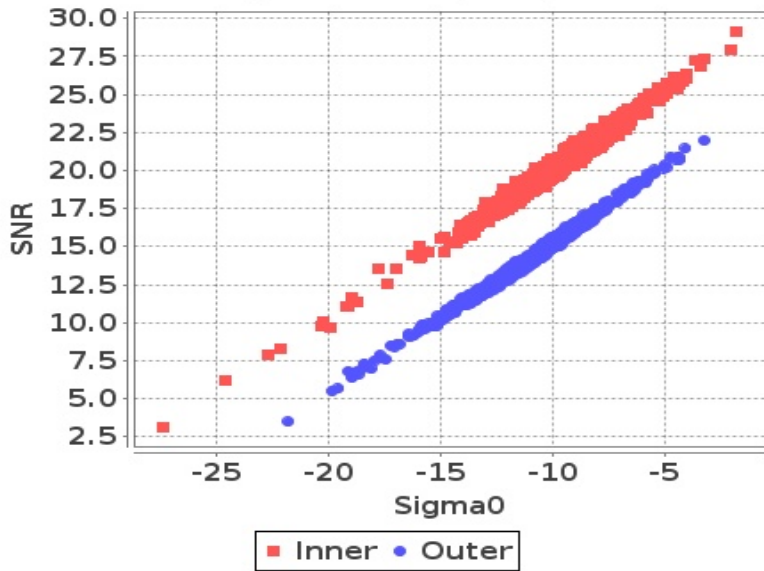
	Inner Beam (HH)				Outer Beam (VV)				Parameter Specifications		
	Min	Max	Mean	Bad Occ. (%)	Min	Max	Mean	Bad Occ. (%)	Parameter	Min	Max
<b>Incidence Angle (deg)</b>	48.70	49.31	49.02	0.000	57.50	58.11	57.87	0.000	Inci.(Inner)	47.10	49.90
<b>Azimuth Diff. (deg)</b>	0.0027	215.58	1.27	2.080	0.0027	297.56	1.28	3.085	Inci.(Outer)	57.30	58.90
<b>Range(Km)</b>	1031.32	1072.50	1047.35	0.000	1208.45	1259.95	1228.19	3.872	Azimuth Diff.	0.60	2.00
<b>X Factor(dbm)</b>	-91.48	-89.85	-90.38	0.000	-93.47	-91.90	-92.11	0.000	Range(Inner)	1025.00	1095.70
<b>Across Distance (Km)</b>	15.70	16.29	15.97	0.000	20.83	21.36	21.02	0.000	Range(Outer)	1210.00	1280.00
<b>Along Distance (Km)</b>	19.06	1357.54	22.50	2.000	18.72	1773.37	23.29	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
									<span style="display: inline-block; width: 15px; height: 15px; background-color: green; border: 1px solid black; margin-right: 5px;"></span> Normal	<span style="display: inline-block; width: 15px; height: 15px; background-color: orange; border: 1px solid black; margin-right: 5px;"></span> Alarming	
									<span style="display: inline-block; width: 15px; height: 15px; background-color: yellow; border: 1px solid black; margin-right: 5px;"></span> Deviations	<span style="display: inline-block; width: 15px; height: 15px; background-color: red; border: 1px solid black; margin-right: 5px;"></span> High Errors	



## Sigma0 Behaviour (Sigma0 Vs SNR)

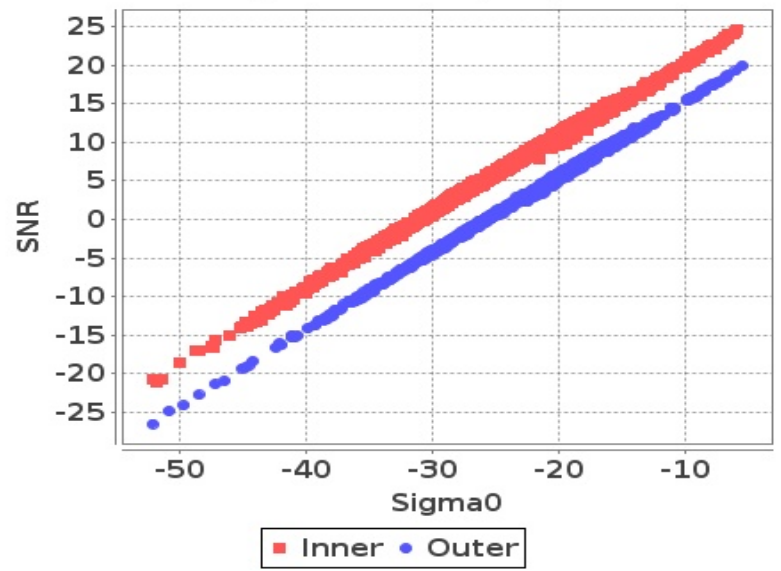
Footprint-Land

Sigma0 Vs SNR (Land)



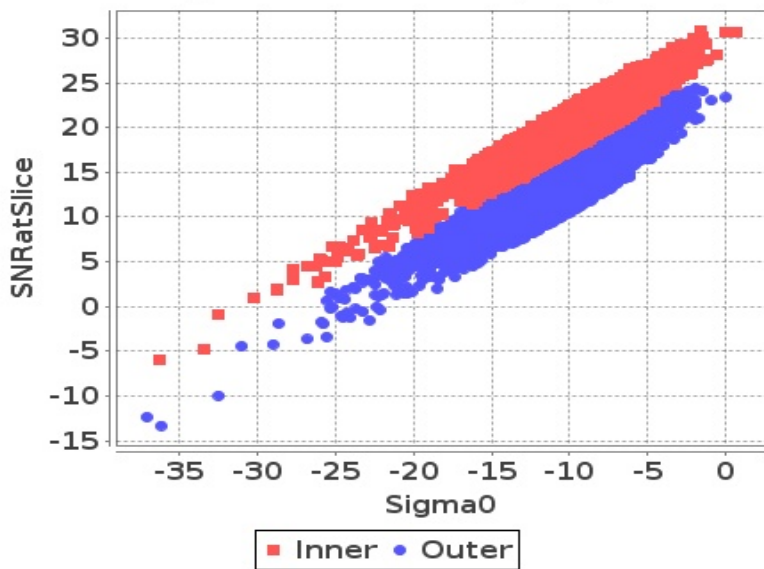
Footprint-Sea

Sigma0 Vs SNR (Sea)



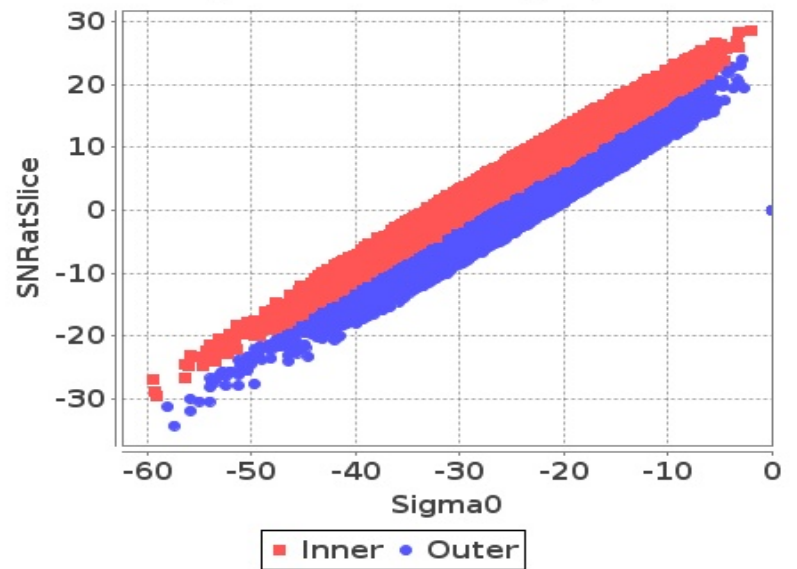
Slice-Land

Sigma0 Vs SNRatSlice (Land)



Slice-Sea

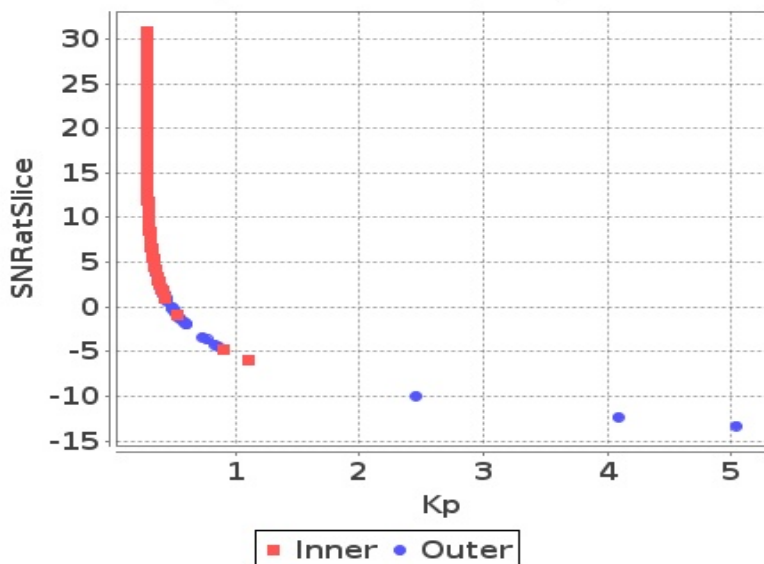
Sigma0 Vs SNRatSlice (Sea)



## Sigma0 Behaviour (Kp Vs SNR)

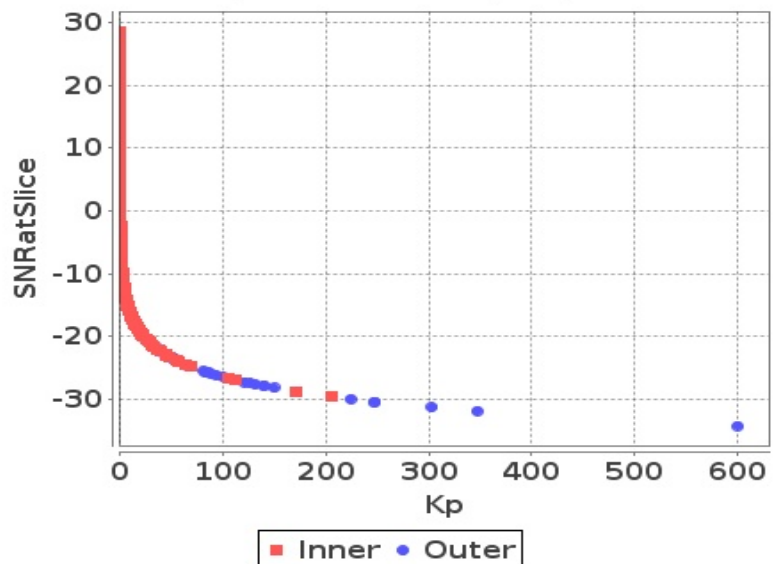
Slice

Kp Vs SNRatSlice (Land)



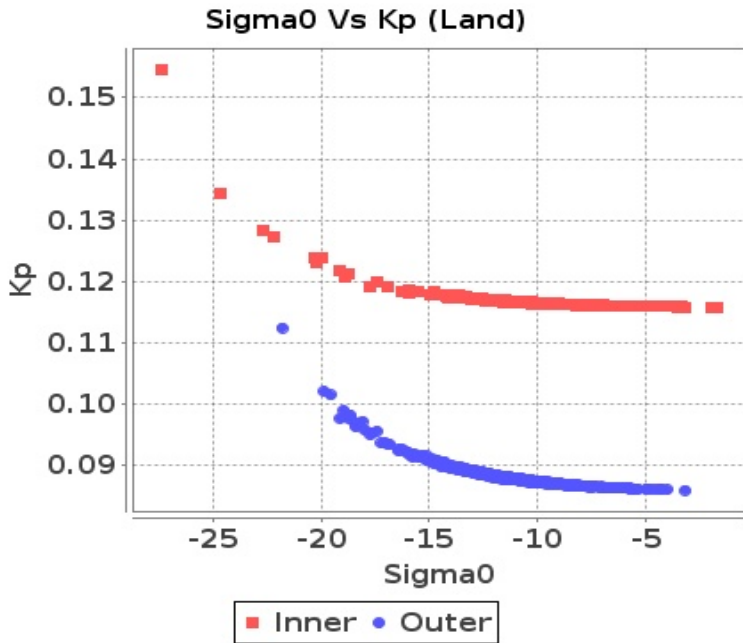
Slice

Kp Vs SNRatSlice (Sea)

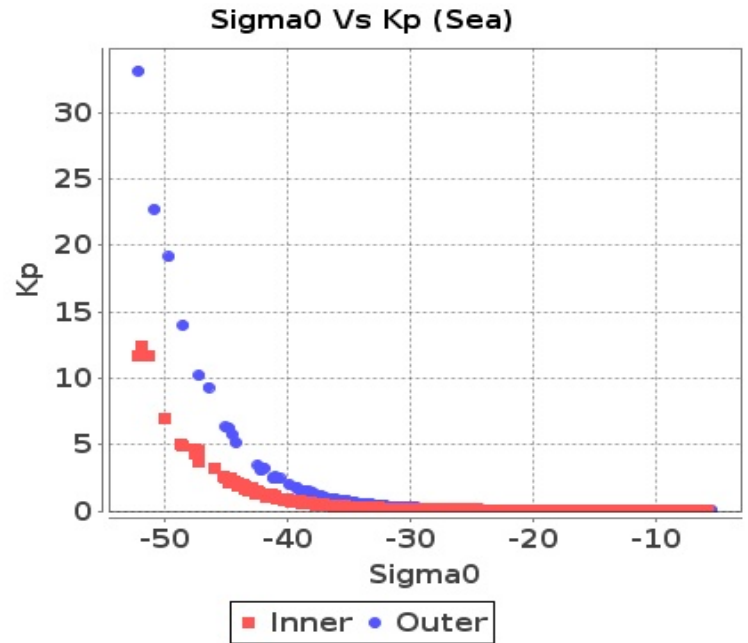


# Sigma0 Behaviour(Sigma0 Vs Kp)

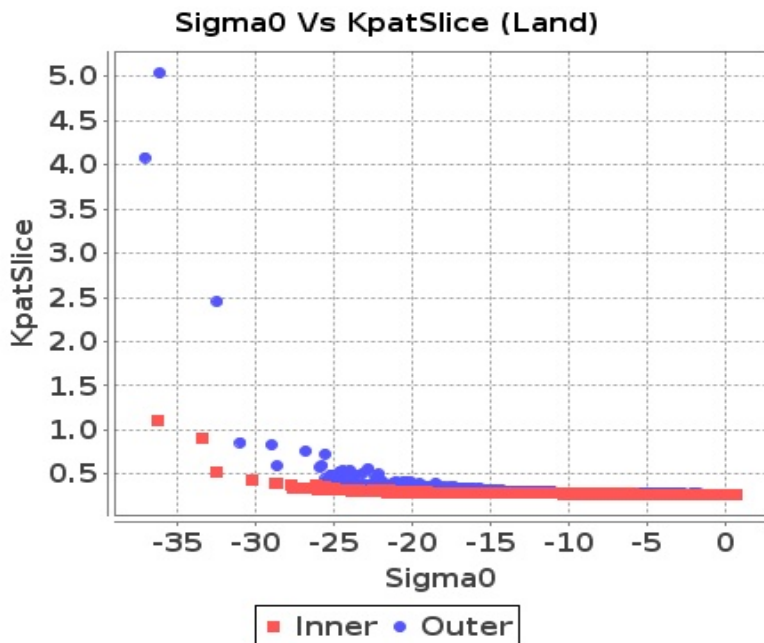
## Footprint-Land



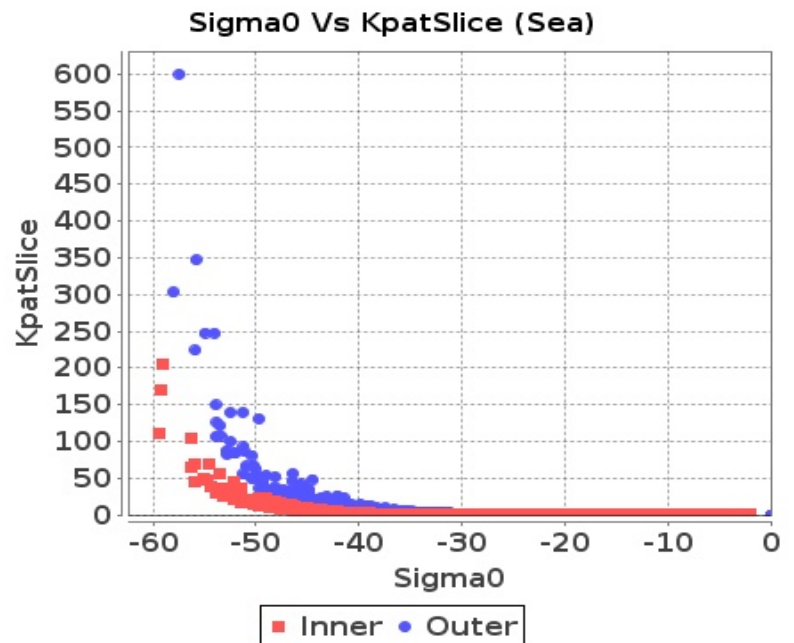
## Footprint-Sea



## Slice-Land



## Slice-Sea



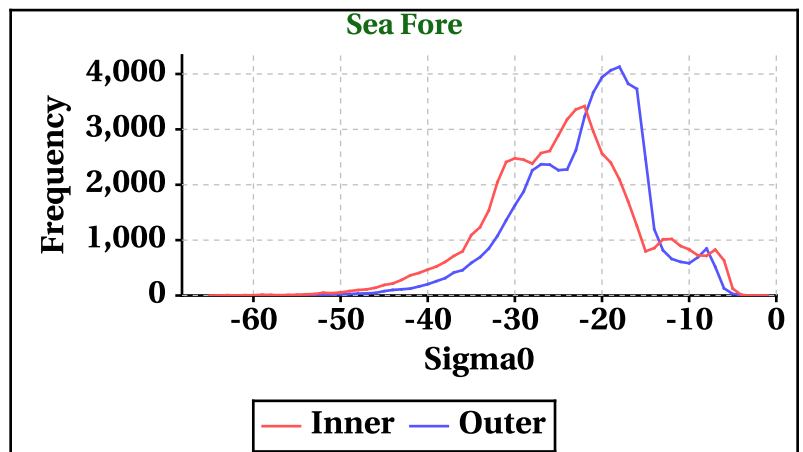
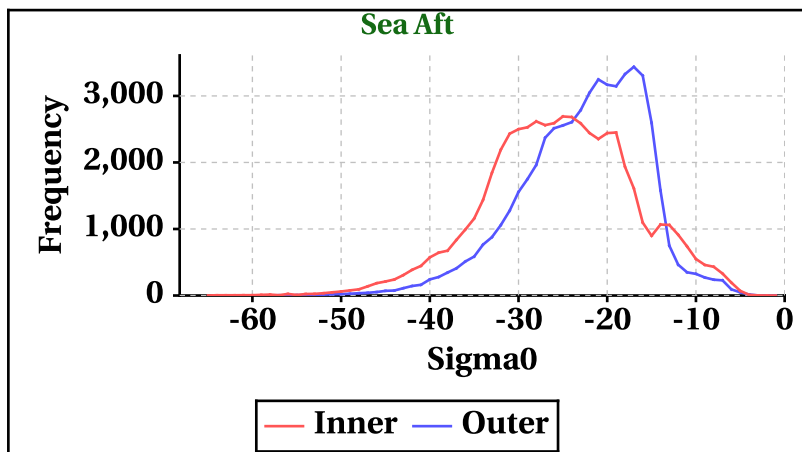
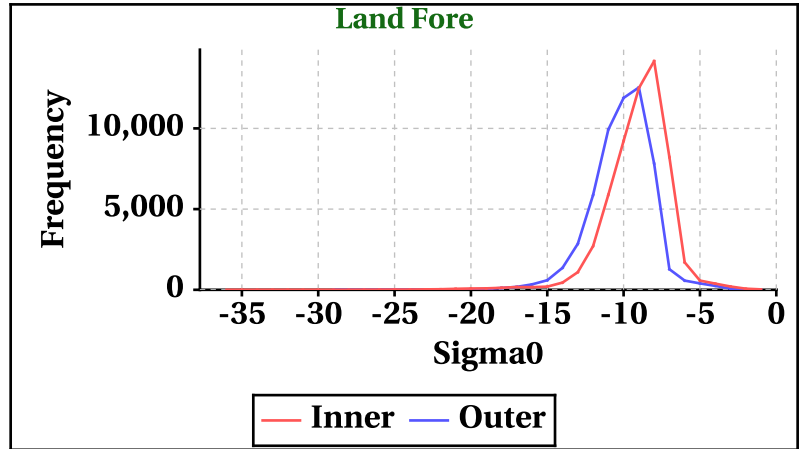
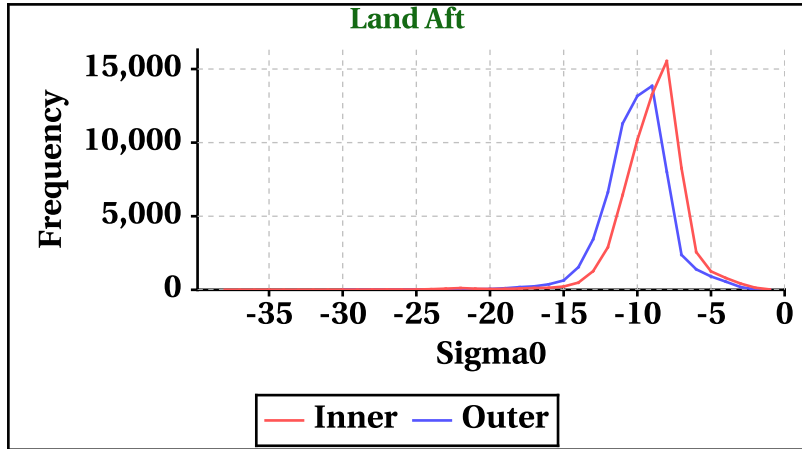


# Dynamic Range (Data Histograms)

## Sigma0(db)

Inner Beam (HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-38	-36	-65	-65
Max	0	0	0	0

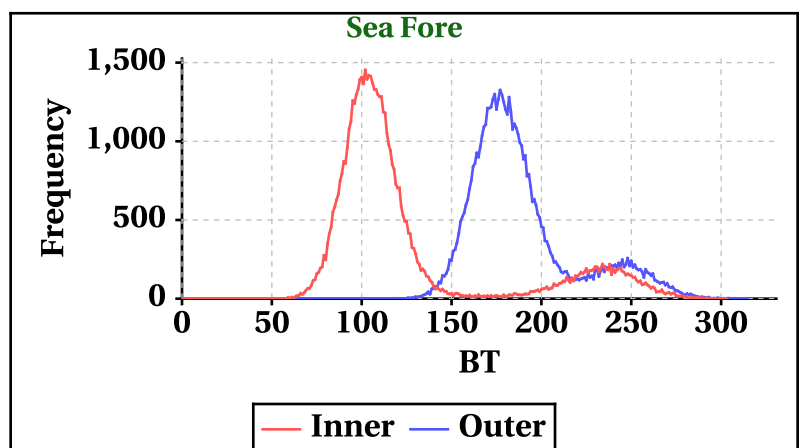
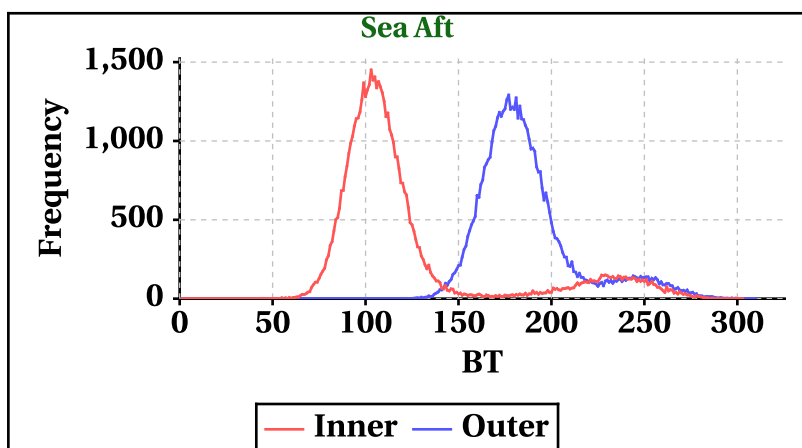
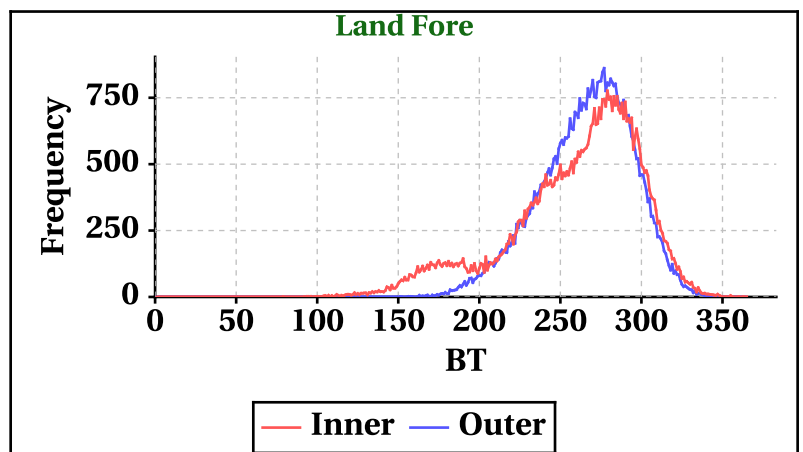
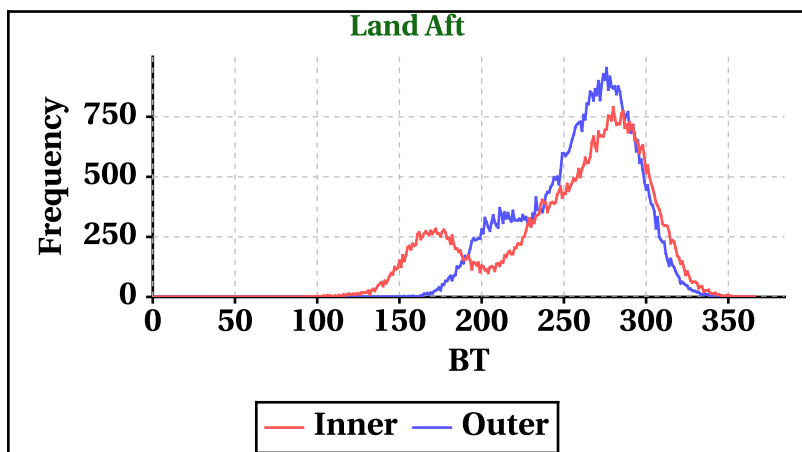
Outer Beam (VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-30	-29	-59	-60
Max	0	0	0	0



## Brightness Temperature(K)

Inner Beam(HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	0	0
Max	366	365	303	303

Outer Beam(VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	0	0
Max	361	364	310	315

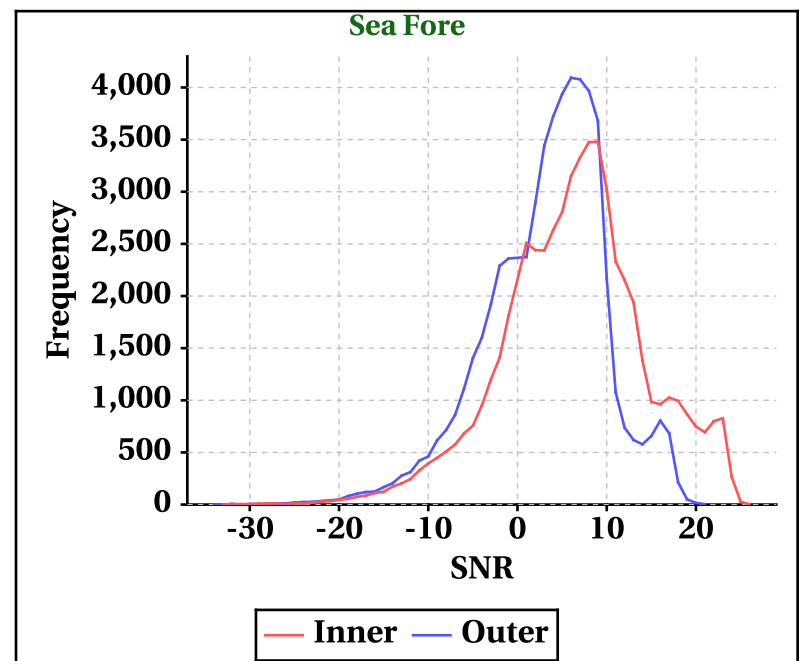
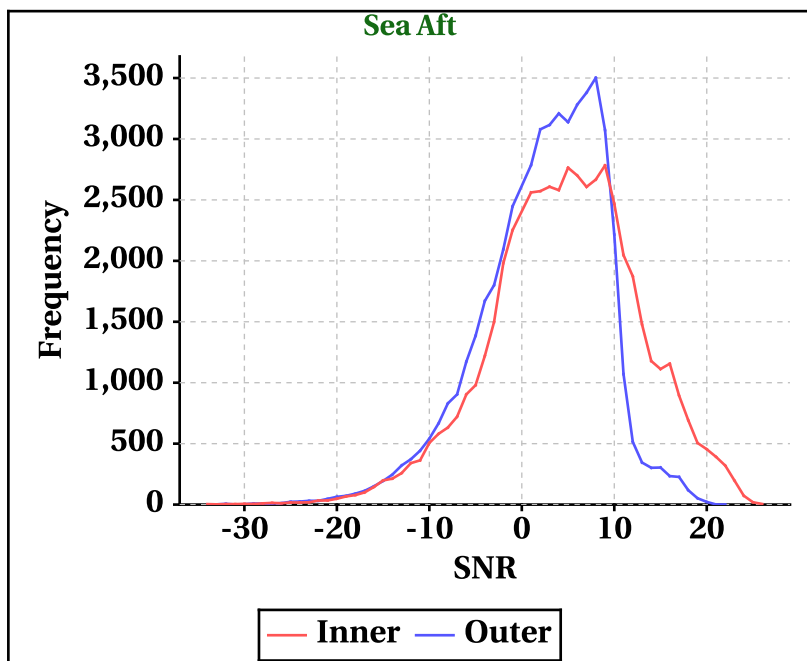
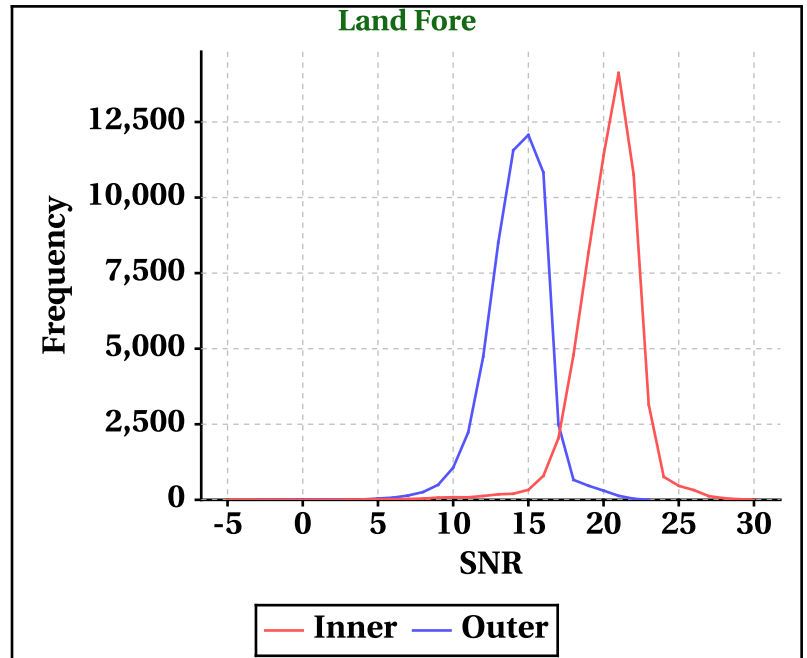
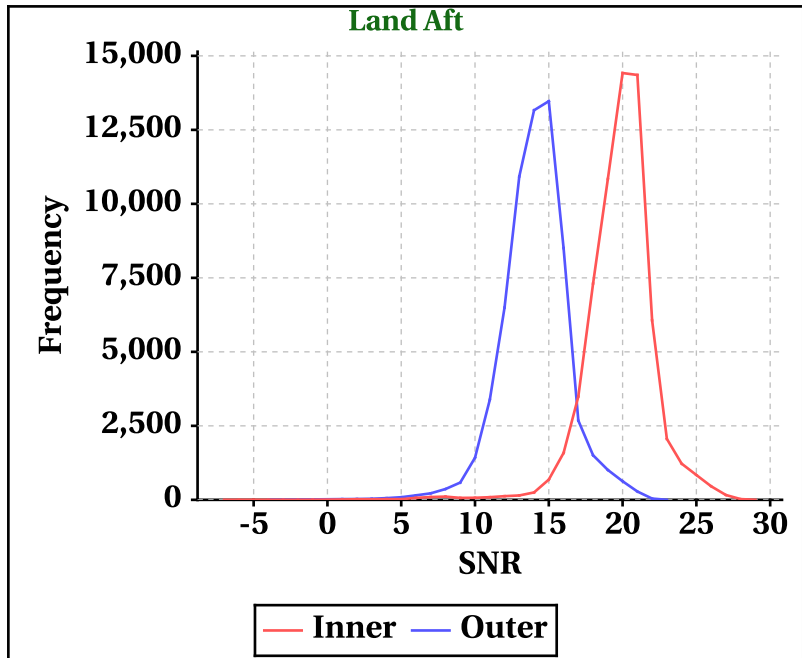


# Dynamic Range (Data Histograms)

## SNR(dBm)

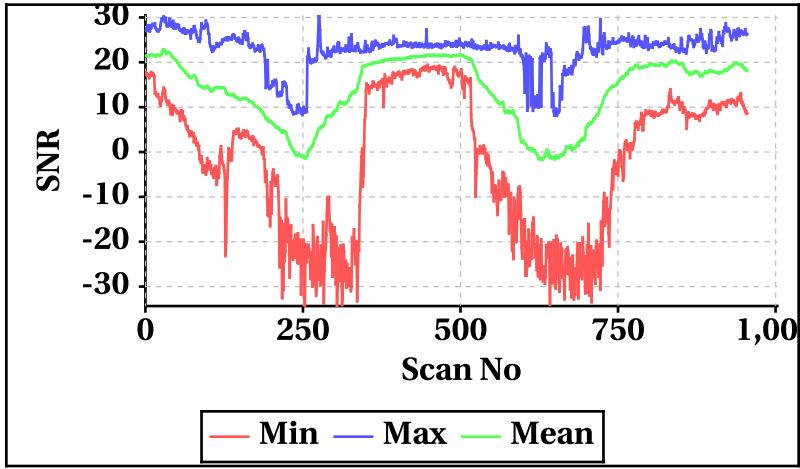
Inner Beam (HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-7	-5	-34	-33
Max	29	30	26	26

Outer Beam (VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-4	-3	-34	-34
Max	23	23	22	21

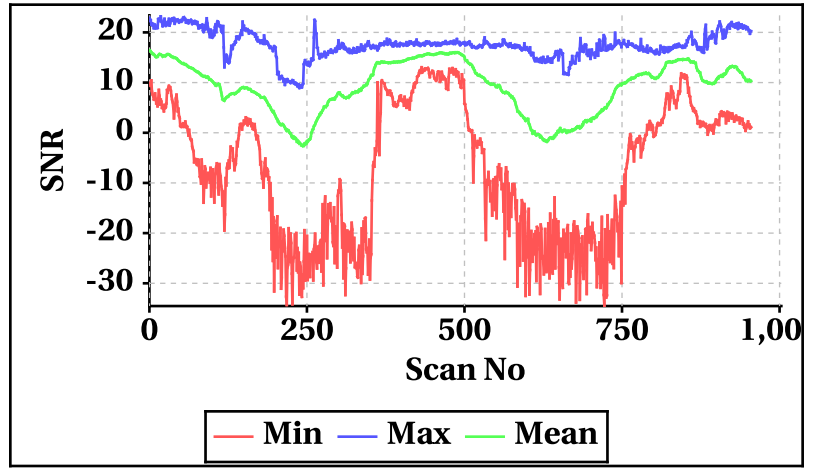


## Orbit-wise behaviour of SNR

Inner Beam (HH)

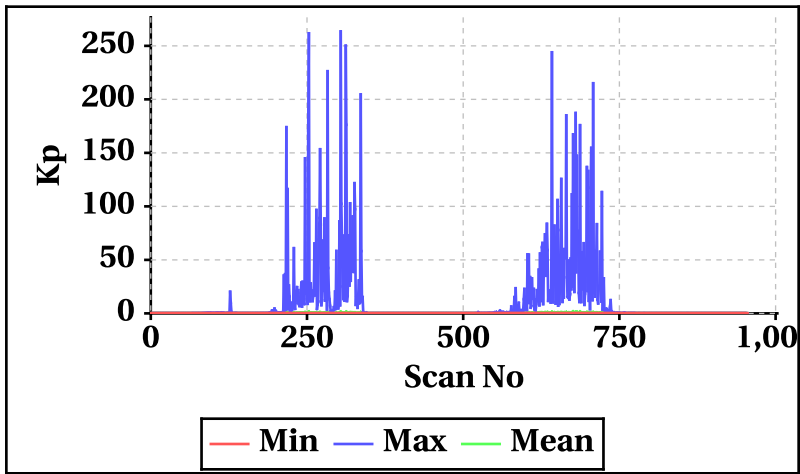


Outer Beam(VV)

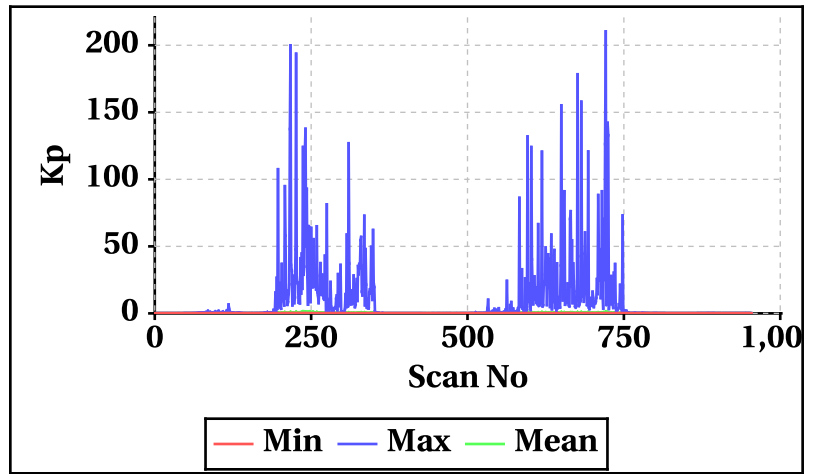


## Orbit-wise behaviour of Kp,Kpa,Kpb,Kpc

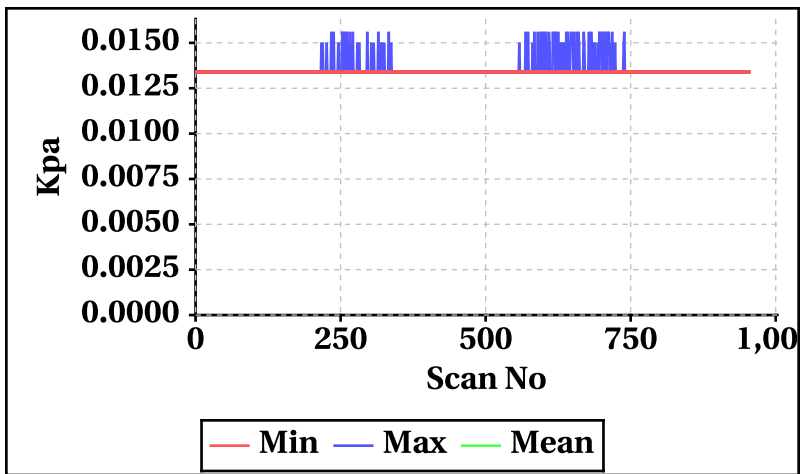
Inner Beam(HH)



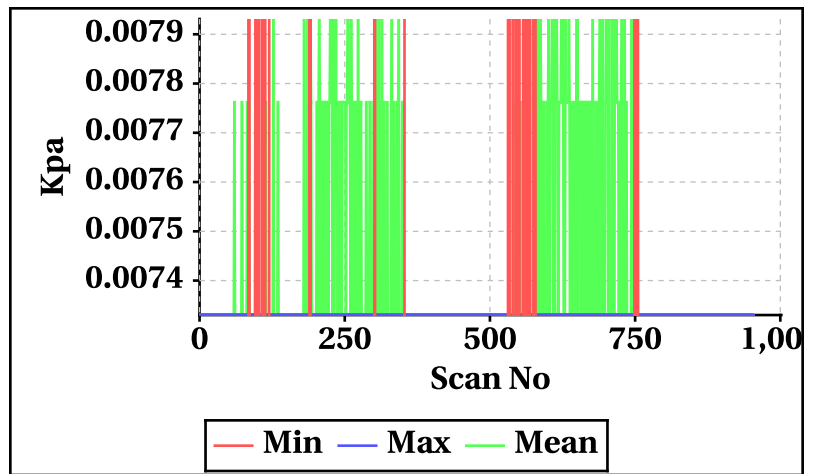
Outer Beam(VV)



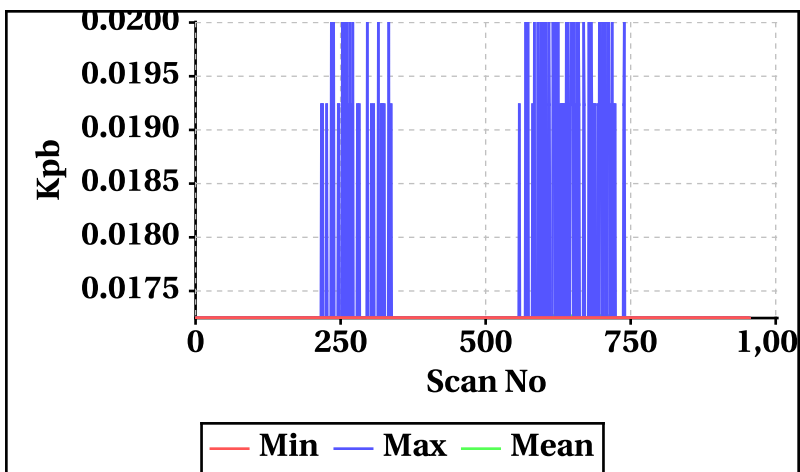
Inner Beam(HH)



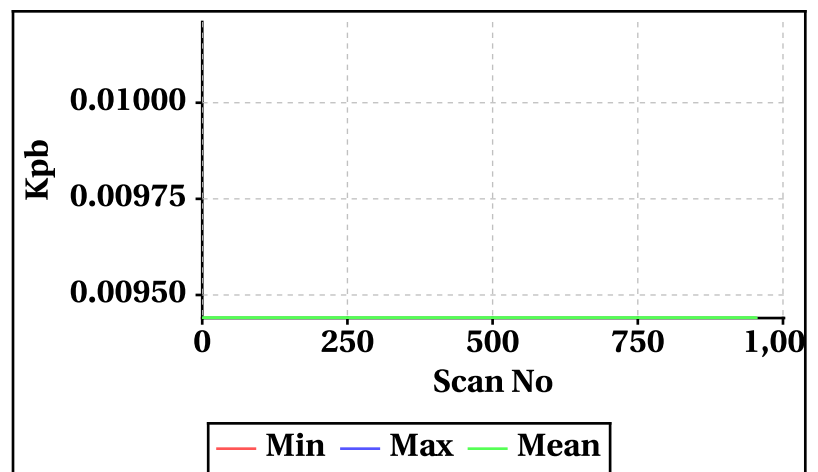
Outer Beam(VV)



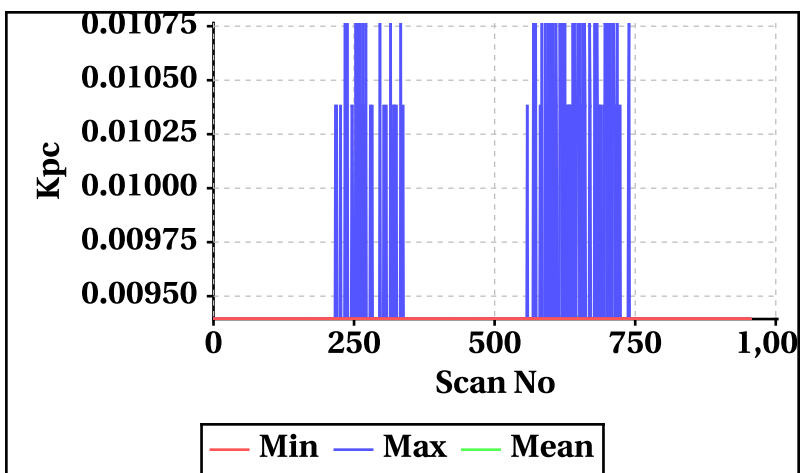
Inner Beam(HH)



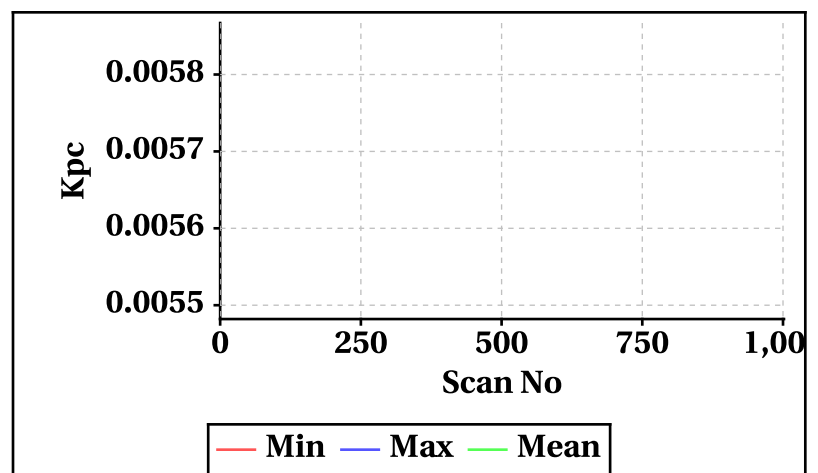
Outer Beam(VV)



Inner Beam(HH)



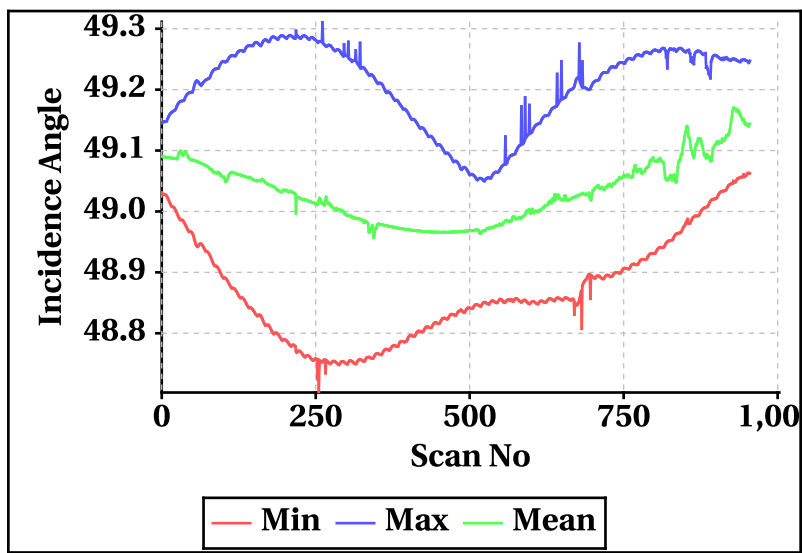
Outer Beam(VV)



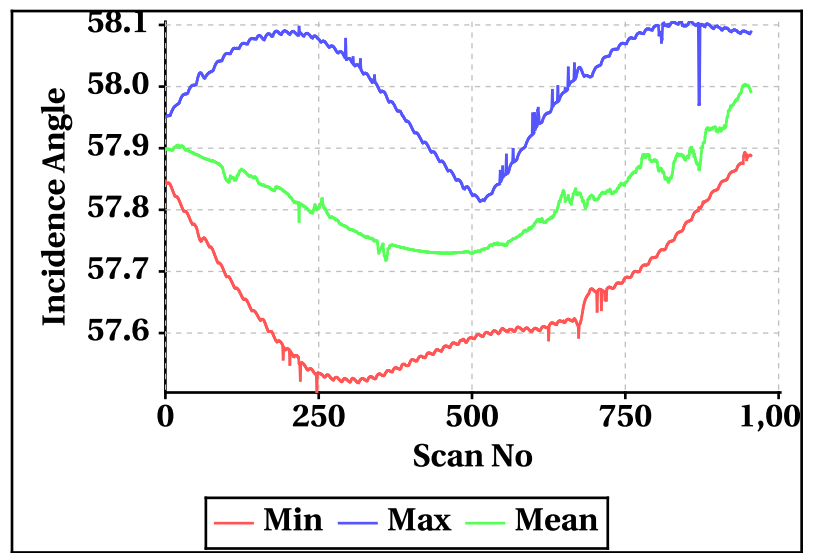


Orbit-wise behaviour of Incidence, Azimuth, Range, X-Factor

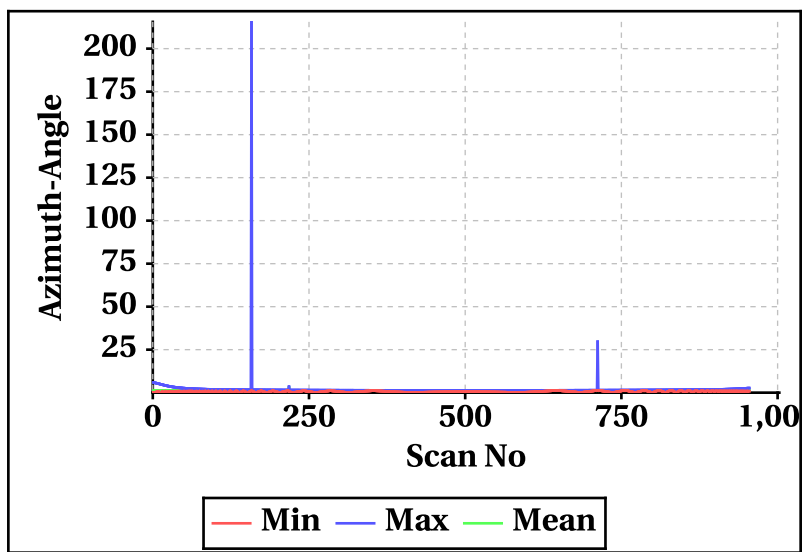
Inner Beam (HH)



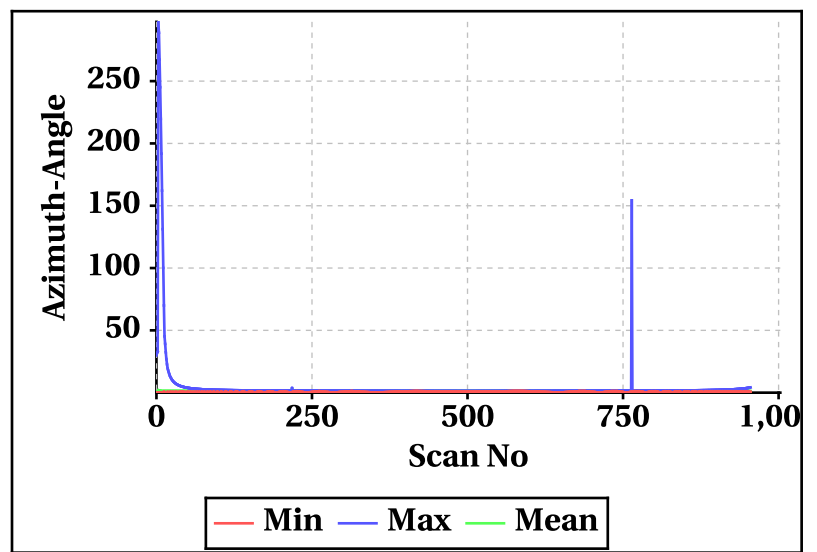
Outer Beam(VV)



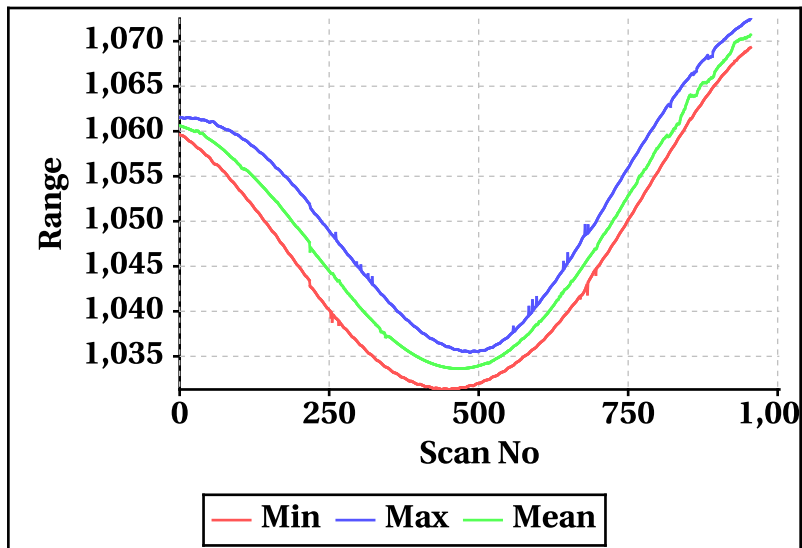
Inner Beam (HH)



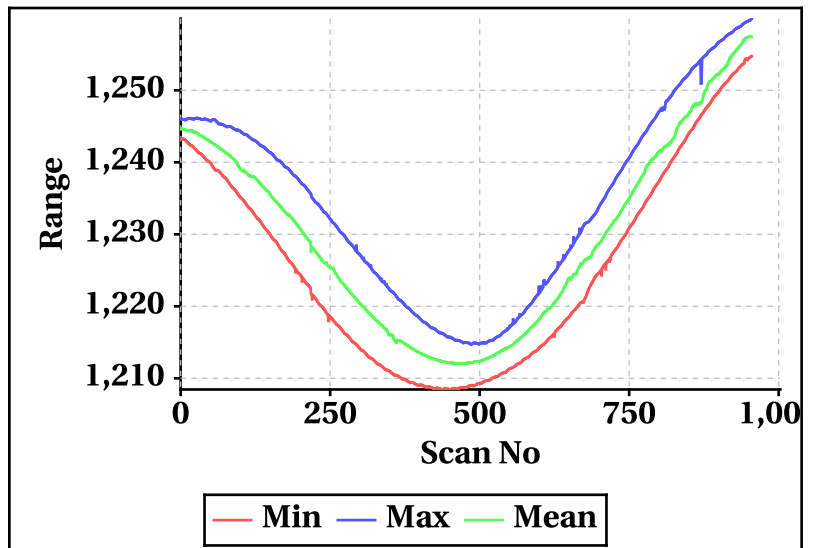
Outer Beam(VV)



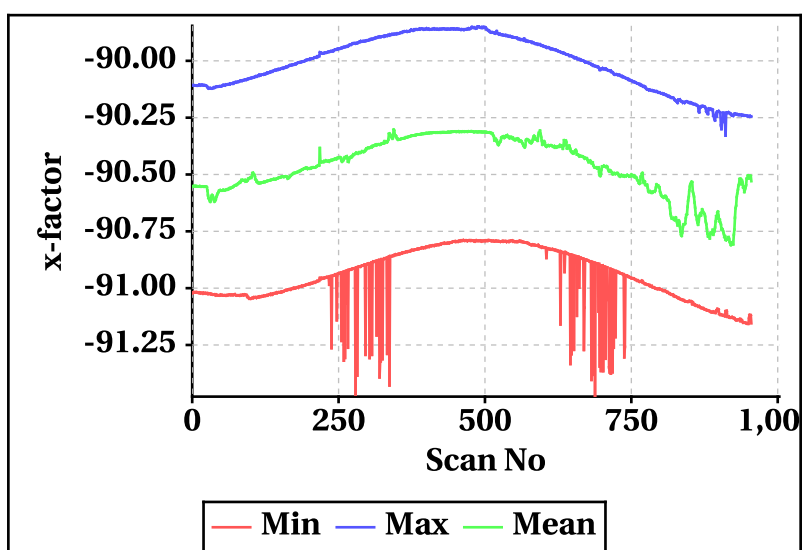
Inner Beam (HH)



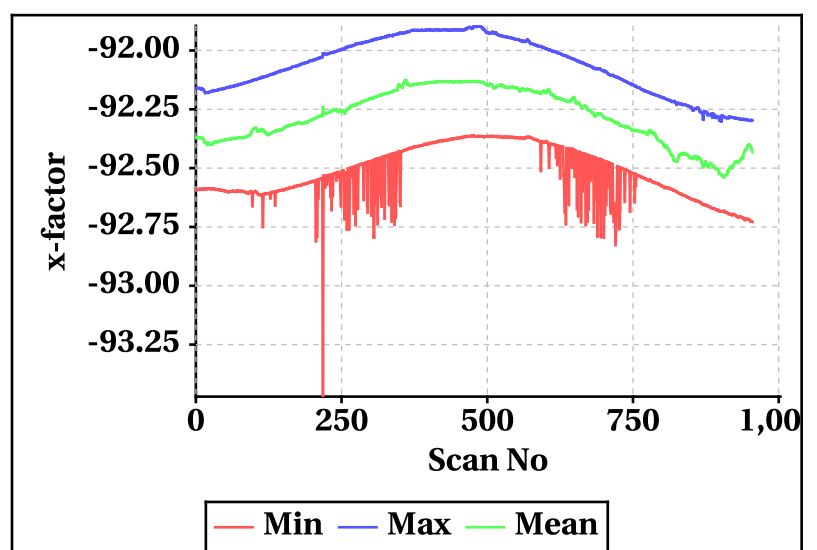
Outer Beam(VV)



Inner Beam (HH)



Outer Beam(VV)

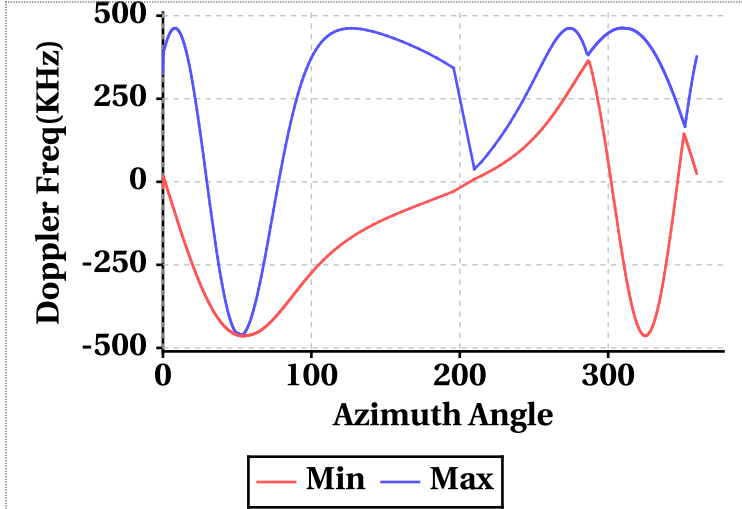


# Doppler Frequency Variation

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

	Inner Beam (HH)	Outer Beam (VV)
<b>Min</b>	-464.14	-520.00
<b>Max</b>	462.88	518.90

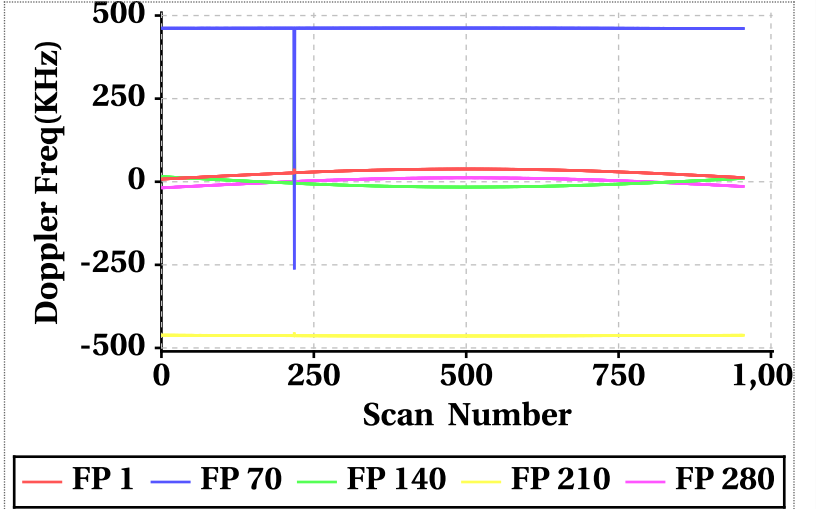
**Footprint wise Doppler frequency variation Inner Beam (HH)**



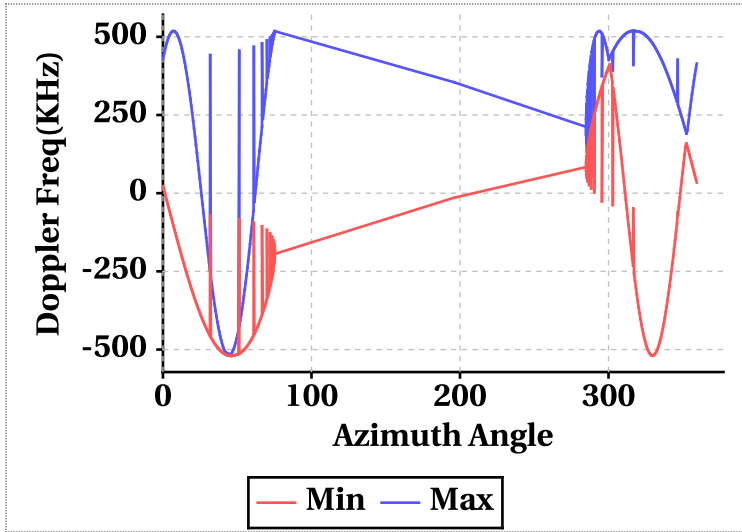
**Doppler Frequency(KHz) variation**

Doppler_FP	Inner Beam (HH)			Outer Beam (VV)		
	Min	Max	Mean	Min	Max	Mean
Doppler_1	7.88	38.32	28.07	3.18	37.42	25.92
Doppler_70	-259.98	462.38	461.24	-279.82	518.56	517.17
Doppler_140	-16.10	424.86	-5.13	-23.76	481.54	-11.49
Doppler_210	-464.06	-456.94	-463.14	-519.80	-509.52	-518.92
Doppler_280	-18.36	325.48	1.98	-14.70	354.94	8.19

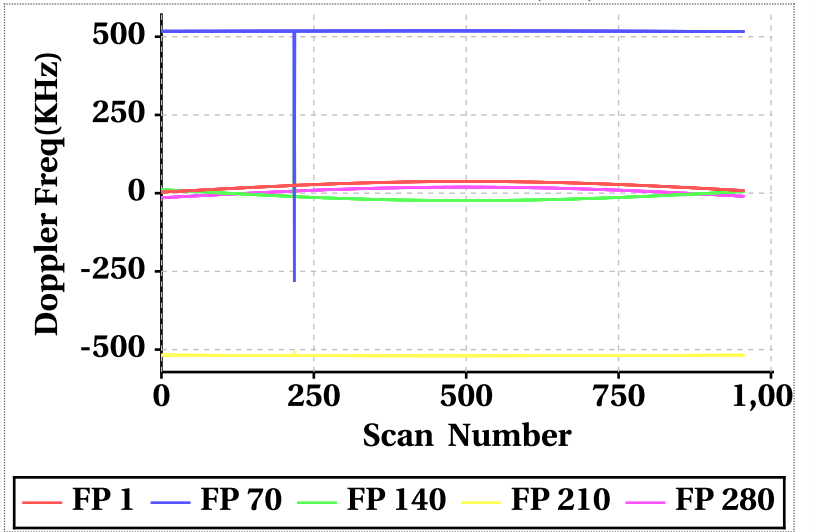
**Doppler frequency variation at footprints: 1, 70, 140, 210 & 280 Inner Beam (HH)**



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

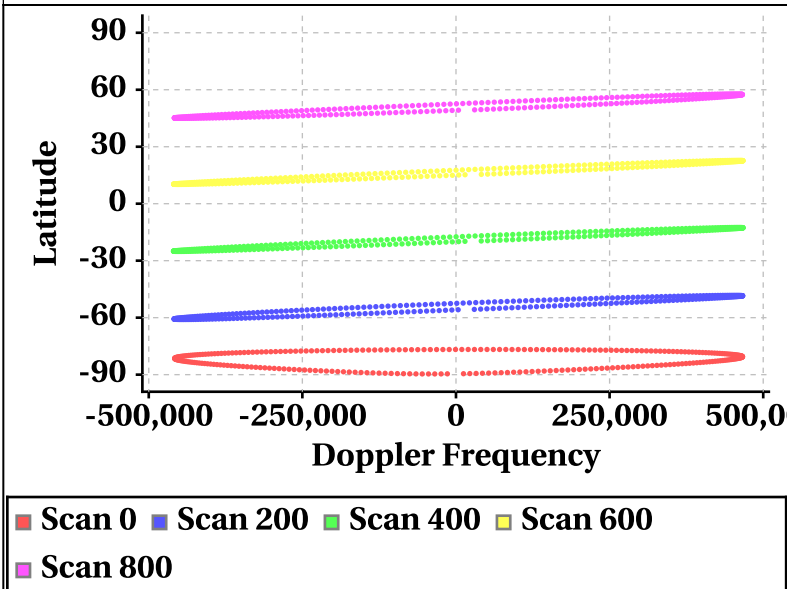


**Doppler frequency variation at footprints: 1, 70, 140, 210 & 280 Outer Beam (VV)**

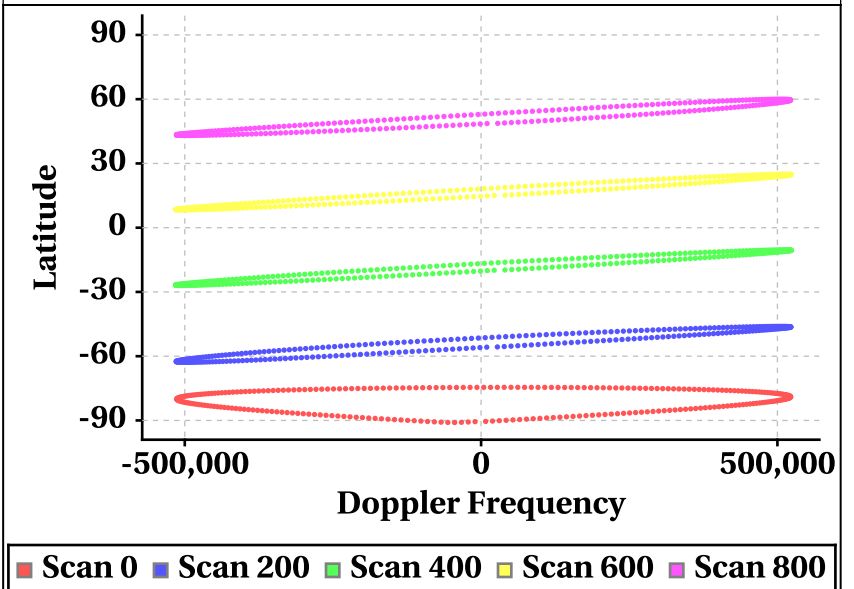


# Latitude Vs Doppler Frequency

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



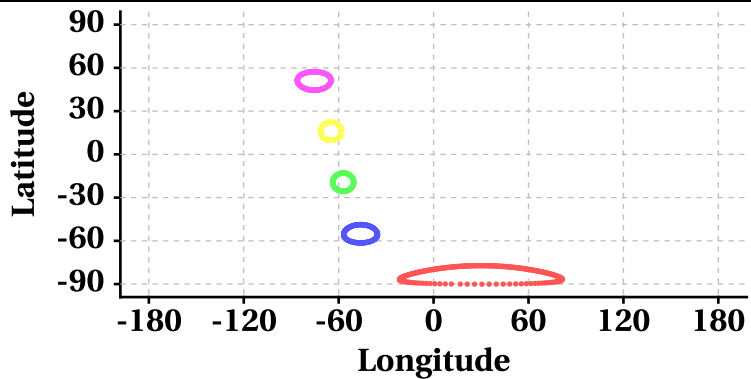
**Doppler Frequency at Scan Interval of 200 [Outer Beam(VV)]**



# Parameter as a function of Latitude

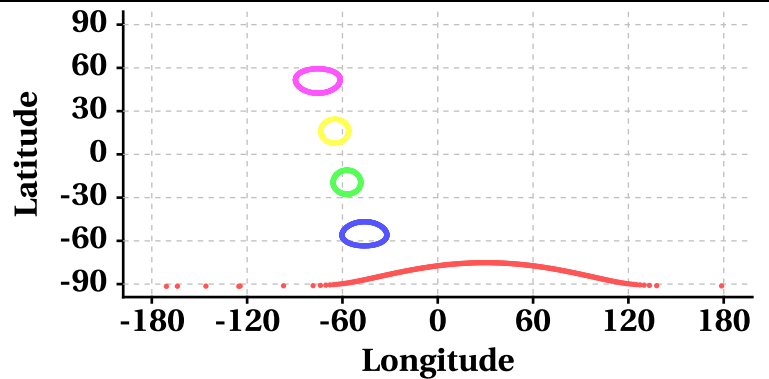
## Latitude Vs Longitude

Scan Trace [Inner Beam(HH)]



Scan 0 Scan 200 Scan 400 Scan 600  
Scan 800

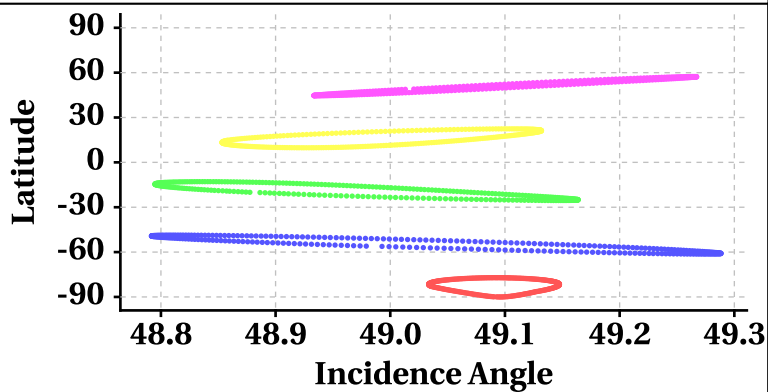
Scan Trace [Outer Beam (VV)]



Scan 0 Scan 200 Scan 400 Scan 600  
Scan 800

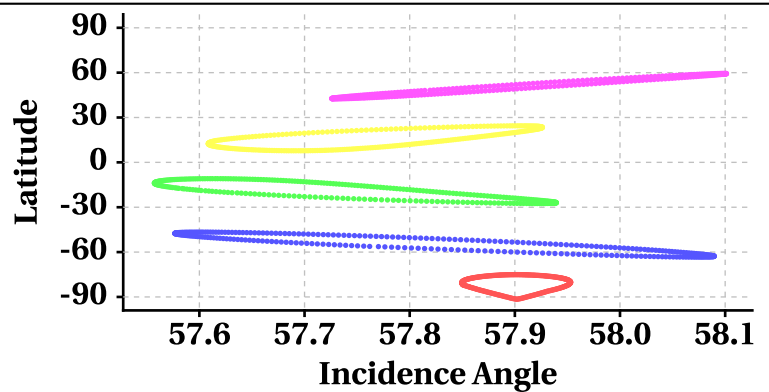
## Latitude Vs Incidence Angle

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



Scan 0 Scan 200 Scan 400 Scan 600  
Scan 800

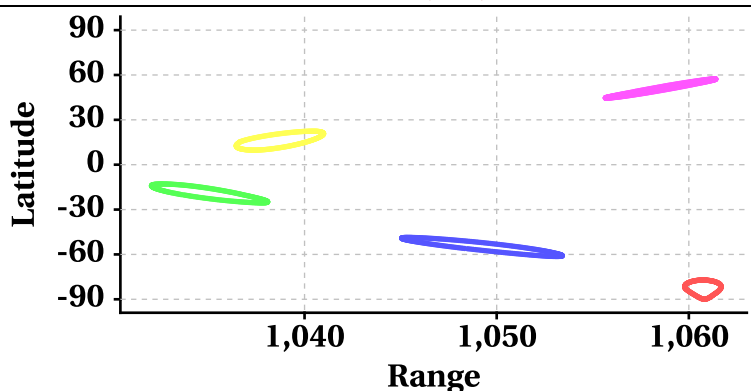
Incidence Angle at Scan Interval of 200 [Outer Beam (VV)]



Scan 0 Scan 200 Scan 400 Scan 600  
Scan 800

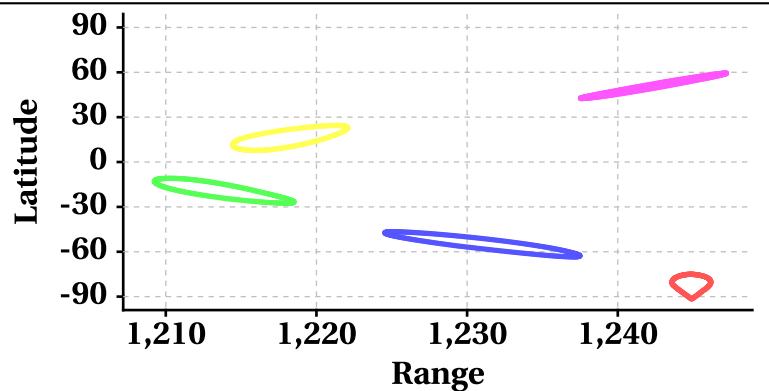
## Latitude Vs Range

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



Scan 0 Scan 200 Scan 400 Scan 600  
Scan 800

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



Scan 0 Scan 200 Scan 400 Scan 600  
Scan 800



# Variation in Orbit and Attitude Parameters

