

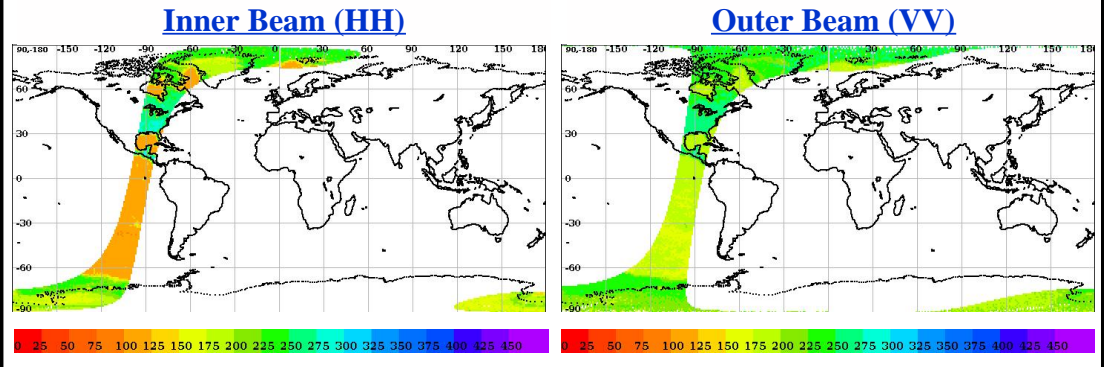
# SCATSAT-1 Scatterometer Level-1B Data Quality Evaluation Report

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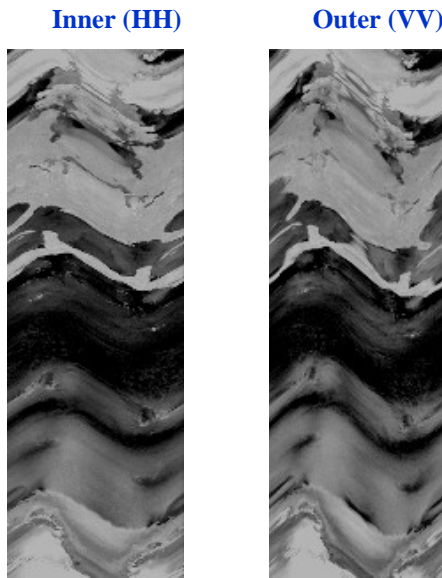
- Half-Orbit Coverage using BT & Sigma-0
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<b>Satellite Id</b>	ScatSat-1	<b>Start Orbit</b>	16695	<b>Total Scans</b>	1017
<b>Sensor Name</b>	Scatterometer	<b>End Orbit</b>	16696	<b>No of Inner FootPrints</b>	281
<b>Processor Version</b>	v1.1.3	<b>Rev. Number</b>	16695_16696	<b>No Of Outer FootPrints</b>	282
<b>Half Orbit Direction</b>	NS	<b>Data Production Date</b>	21-11-2019	<b>No. Of Inner Slices</b>	9
<b>Equator Crossing Date</b>	21-11-2019	<b>Equator Crossing Time</b>	14:41:09.000	<b>No Of Outer Slices</b>	15

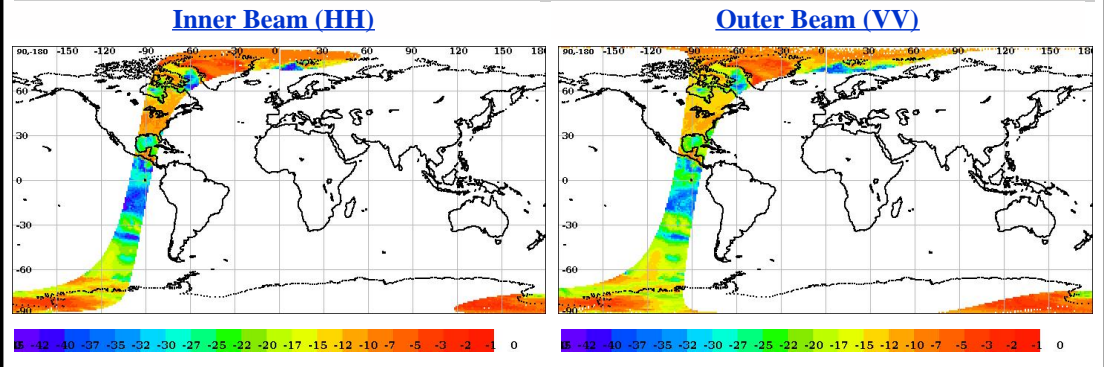
## Brightness Temperature(k) Footprint trace



## Image Snapshot for Inner & Outer Beam



## Sigma0(dB) Footprint trace



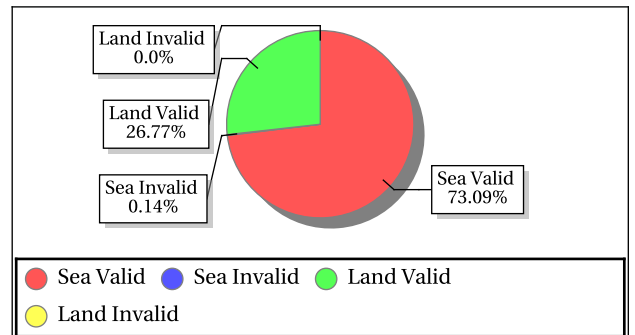
## Invalid and Poor Sigma-0 Quality Flag Statistics for Inner/Outer Slices\*

Sigma-0 Flags	Inner Beam	Outer Beam
Invalid Sigma0(%)	0.14	0.14
Data Not Available From Payload (%)	99.64979	99.96765
Slice not within sample array limits (%)	0.35	0.03
C(S+N) - C(N) < 0.1 (%)	0.00	0.00
Poor Sigma0(%)	22.23	13.35
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 (%)	0.062611	0.141582

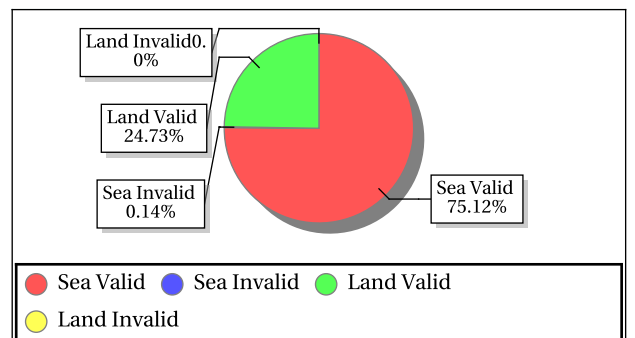
\*DP Format Document

## 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	-5.92	-4.34	-5.11	0.71	156.29	196.61	175.13	14.59
GreenLand_2	77.50	-41.50	Inner	DSC	Fore	-5.42	-3.71	-4.68	0.58	166.77	198.65	179.11	13.12
GreenLand_3	71.55	-42.45	Inner	DSC	Aft	-9.47	-6.90	-8.41	0.50	175.12	214.35	193.84	11.37
GreenLand_3	71.55	-42.45	Inner	DSC	Fore	-9.87	-7.09	-8.50	0.74	168.94	220.94	191.65	11.45
GreenLand_1	74.69	-42.50	Inner	DSC	Aft	-10.36	-7.88	-9.10	0.78	164.15	208.71	183.02	13.06
GreenLand_1	74.69	-42.50	Inner	DSC	Fore	-10.09	-8.03	-8.84	0.58	161.35	224.50	185.84	16.20
GreenLand_2	77.50	-41.50	Outer	DSC	Aft	-4.94	-4.59	-4.76	0.18	218.89	244.43	231.66	12.77
GreenLand_2	77.50	-41.50	Outer	DSC	Fore	-14.56	-3.54	-9.05	5.51	221.15	244.61	232.88	11.73
GreenLand_3	71.55	-42.45	Outer	DSC	Aft	-11.29	-9.53	-10.39	0.52	205.17	251.65	233.53	13.76
GreenLand_3	71.55	-42.45	Outer	DSC	Fore	-11.20	-10.02	-10.57	0.41	204.68	248.84	229.01	13.59
GreenLand_1	74.69	-42.50	Outer	DSC	Aft	-10.13	-8.12	-8.95	0.59	210.93	240.77	226.15	11.51
GreenLand_1	74.69	-42.50	Outer	DSC	Fore	-9.84	-7.53	-8.65	0.80	220.16	255.36	240.41	13.05



## 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	305.99	0.62	7.032	0.12	299.71	0.51	5.689	0.12	1.83	0.12	0.003	0.12	4.09	0.12	0.015
<b>Kpa</b>	0.01	0.02	0.01	0.000	0.01	0.03	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	0.04	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	0.02	0.01	0.000	0.01	0.01	0.01	0.000	0.01	0.01	0.01	0.000
<b>SNR</b>	-34.99	28.26	3.90	0.059	-34.90	27.66	4.46	0.031	-12.55	31.70	18.48	12.833	-16.16	29.82	19.74	23.273

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	204.39	0.53	6.506	0.09	198.18	0.47	5.694	0.09	0.39	0.09	0.000	0.09	101.36	0.09	0.010
<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>	-34.41	21.47	1.61	0.000	-34.27	22.60	1.56	0.001	-6.37	22.76	12.40	0.122	-31.36	23.25	13.50	0.729

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)

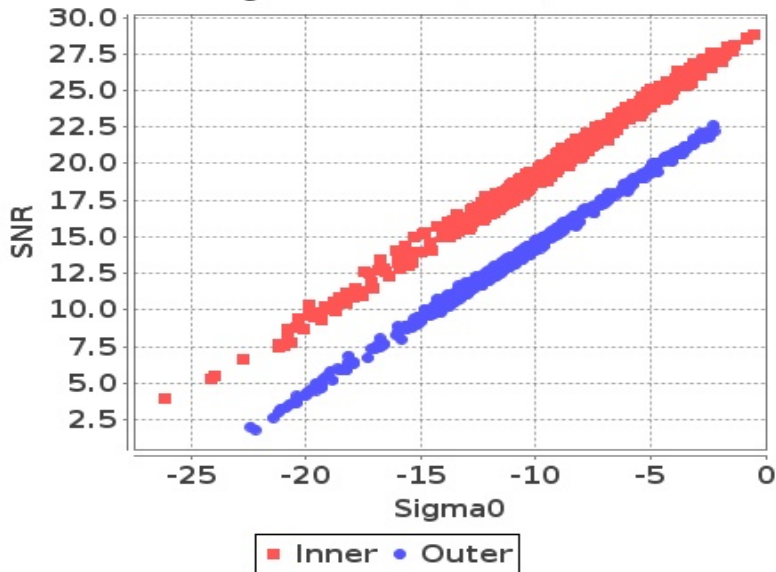
	Inner Beam (HH)				Outer Beam (VV)				Parameter Specifications		
	Min	Max	Mean	Bad Occ. (%)	Min	Max	Mean	Bad Occ. (%)	Parameter	Min	Max
<b>Incidence Angle (deg)</b>	48.73	49.35	49.00	0.000	57.47	58.12	57.87	0.000	Inci.(Inner)	47.10	49.90
<b>Azimuth Diff. (deg)</b>	0.0000	266.52	1.28	2.865	0.0000	299.00	1.27	4.118	Inci.(Outer)	57.30	58.90
<b>Range(Km)</b>	1030.27	1077.68	1049.45	0.000	1207.41	1265.74	1230.16	3.858	Azimuth Diff.	0.60	2.00
<b>X Factor(dbm)</b>	-94.19	-89.96	-90.56	0.000	-93.32	-92.00	-92.17	0.000	Range(Inner)	1025.00	1095.70
<b>Across Distance (Km)</b>	15.85	16.44	16.06	0.000	20.96	22.90	21.14	2.000	Range(Outer)	1210.00	1280.00
<b>Along Distance (Km)</b>	18.82	9443.01	54.90	5.000	0.00	9580.80	54.68	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
									<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)

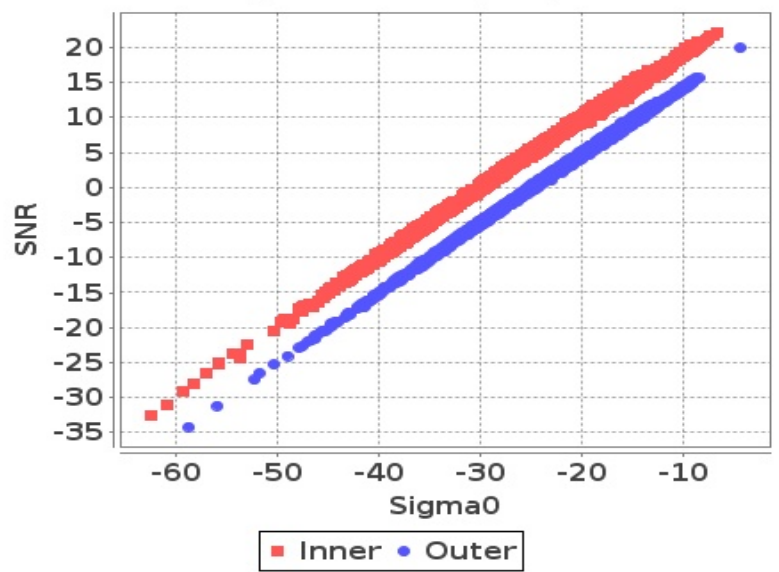
Footprint-Land

Sigma0 Vs SNR (Land)



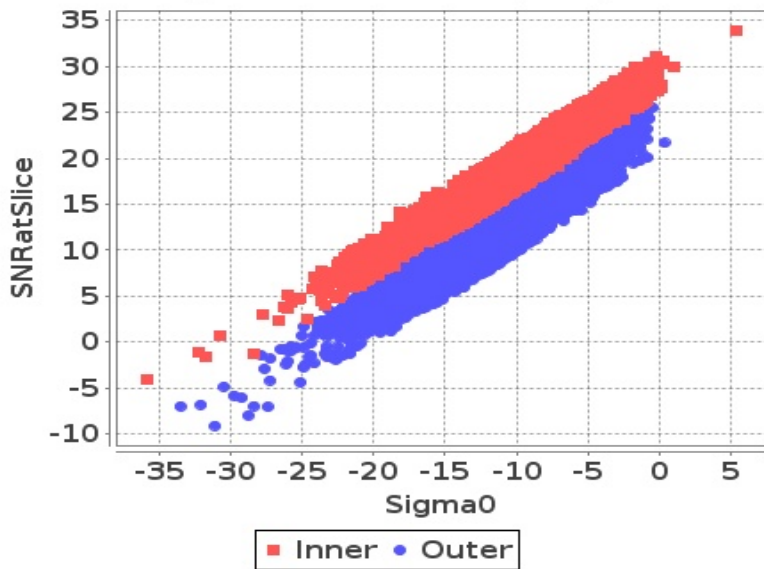
Footprint-Sea

Sigma0 Vs SNR (Sea)



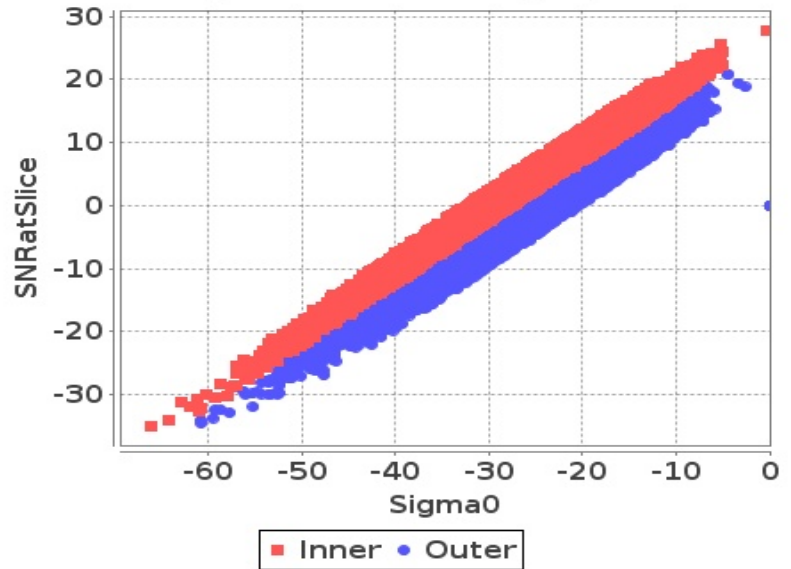
Slice-Land

Sigma0 Vs SNRatSlice (Land)



Slice-Sea

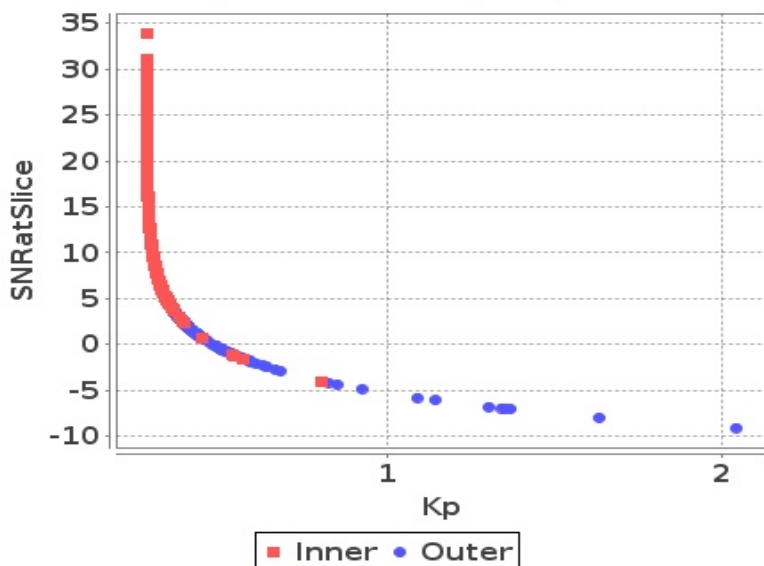
Sigma0 Vs SNRatSlice (Sea)



## Sigma0 Behaviour (Kp Vs SNR)

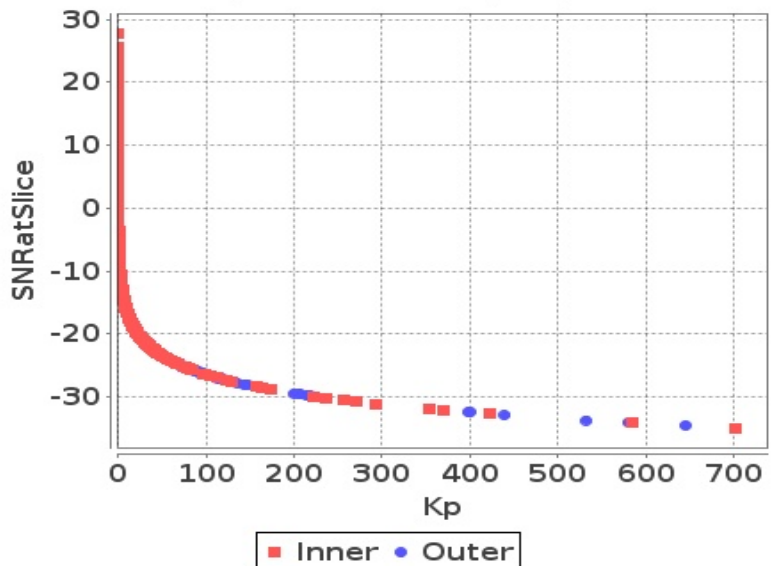
Slice

Kp Vs SNRatSlice (Land)



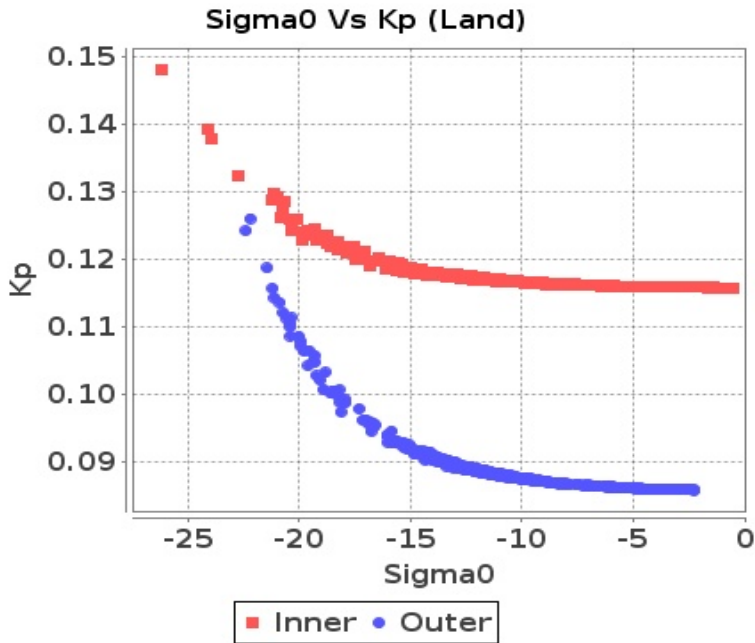
Slice

Kp Vs SNRatSlice (Sea)

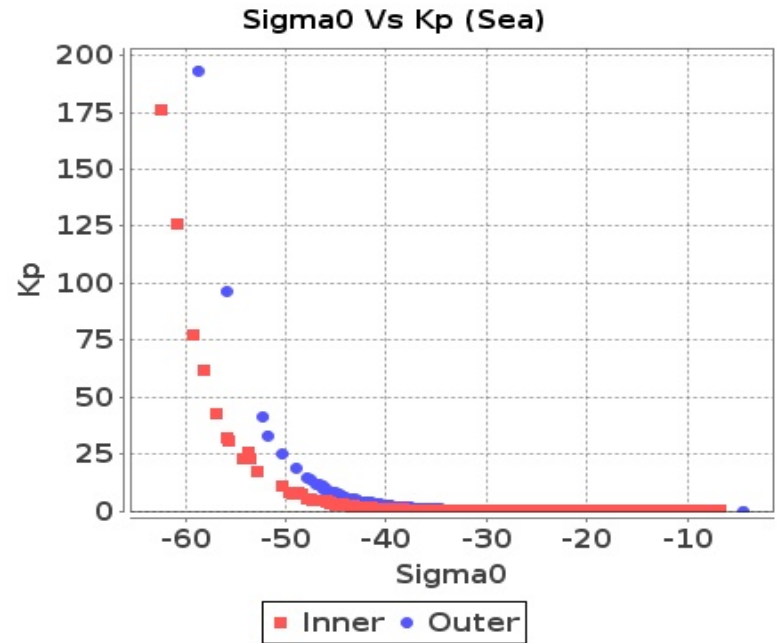


# Sigma0 Behaviour(Sigma0 Vs Kp)

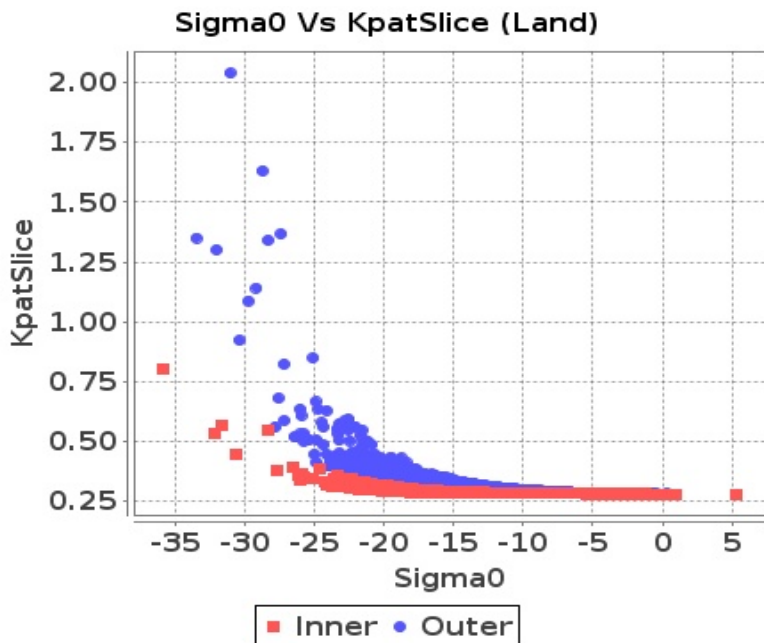
## Footprint-Land



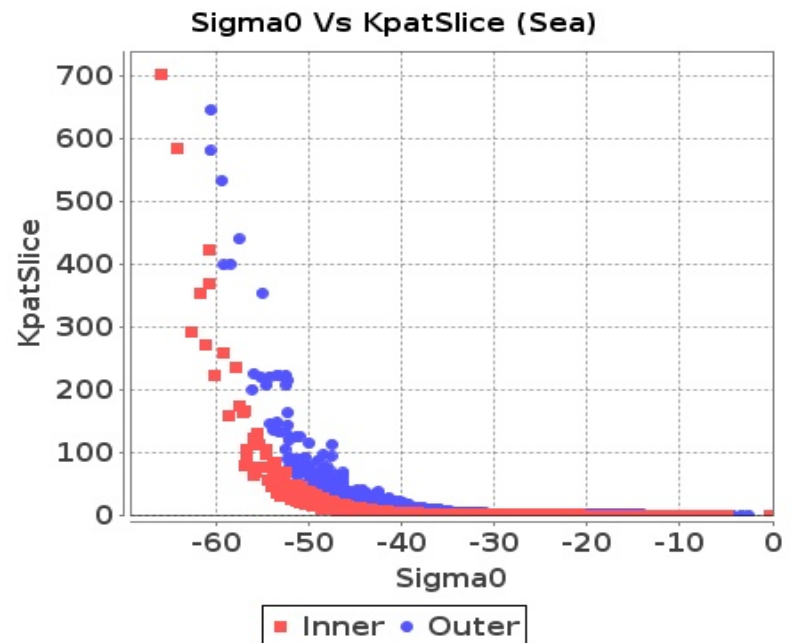
## Footprint-Sea



## Slice-Land



## Slice-Sea



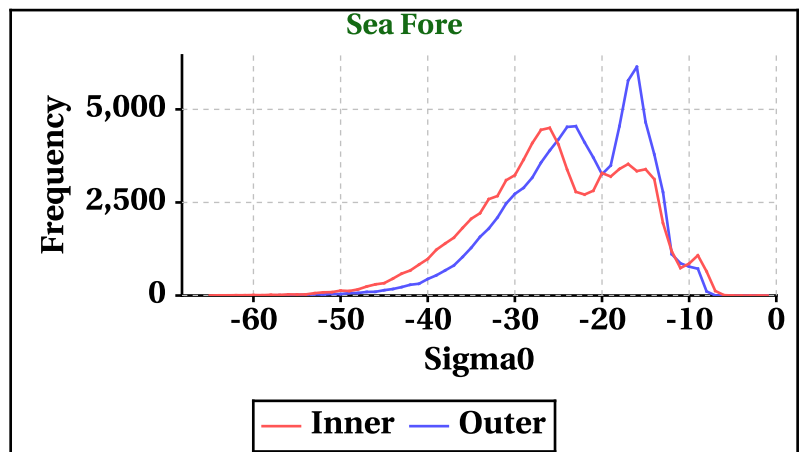
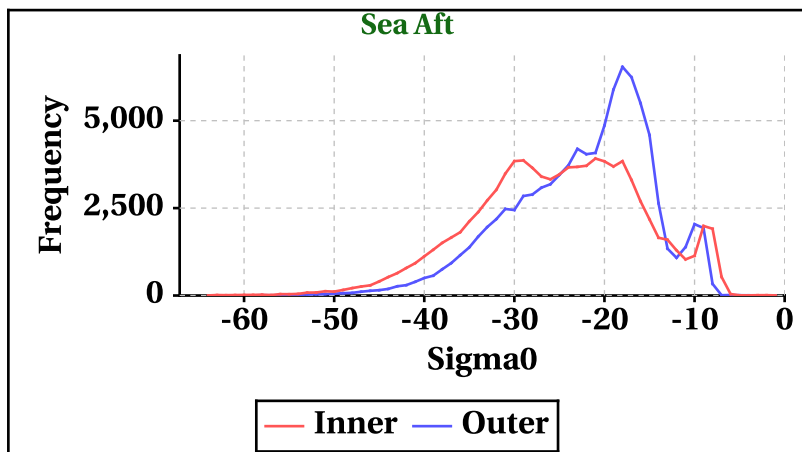
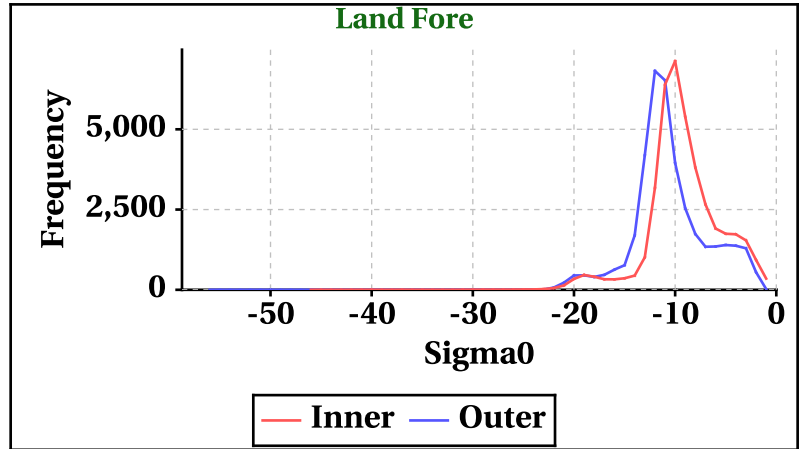
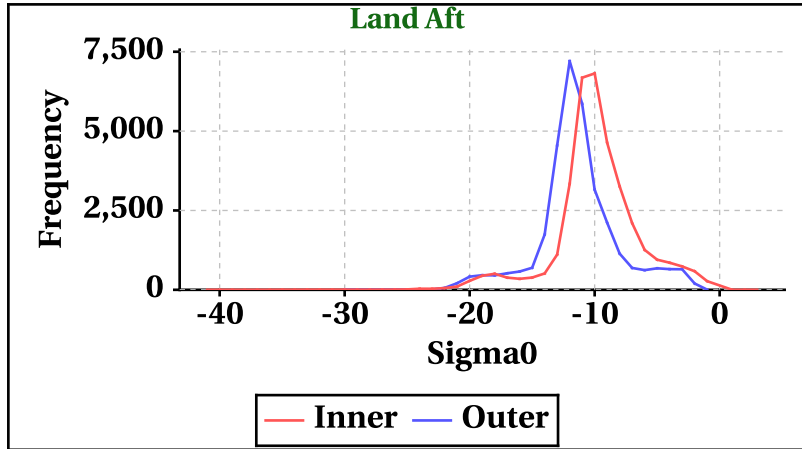


# Dynamic Range (Data Histograms)

## Sigma0(db)

Inner Beam (HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-41	-46	-64	-65
Max	3	0	0	0

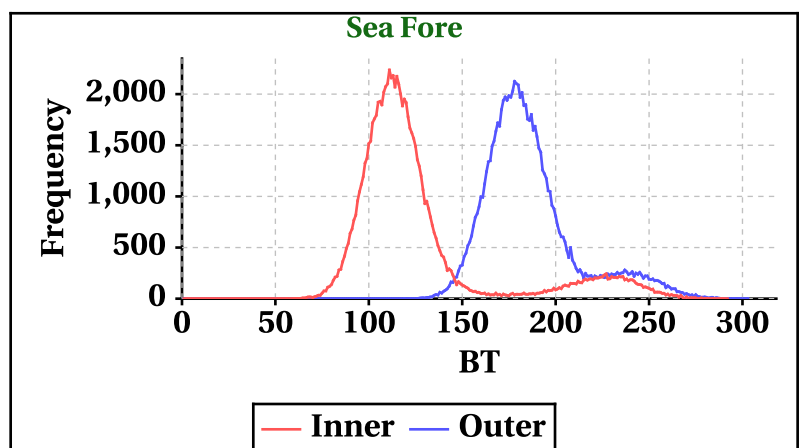
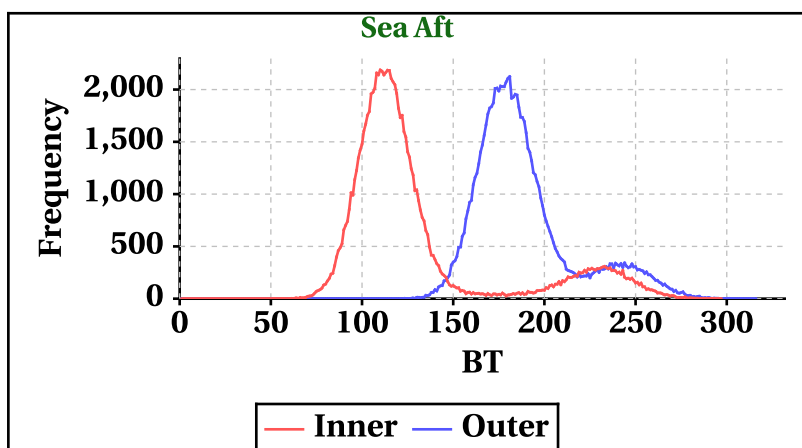
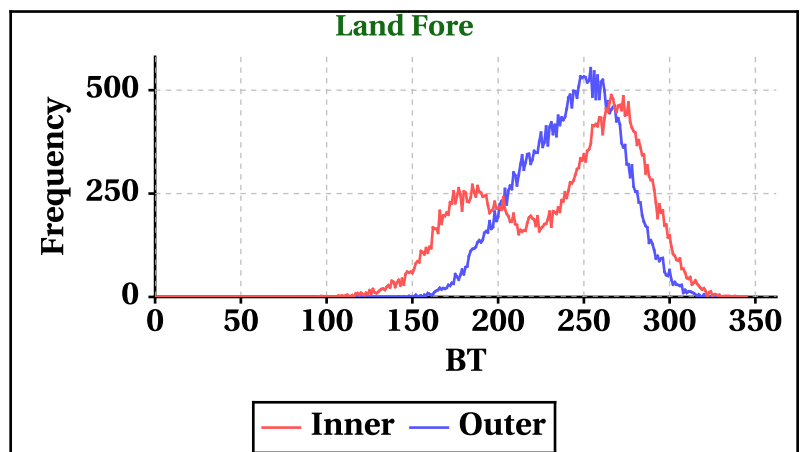
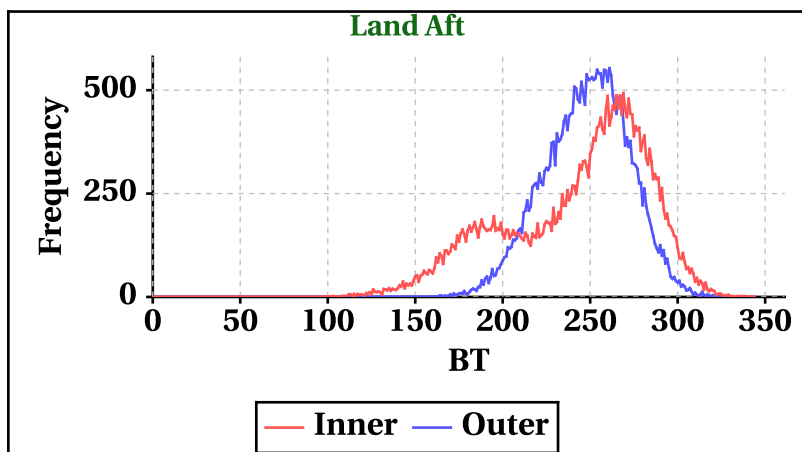
Outer Beam (VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-30	-56	-59	-59
Max	0	0	0	0



## Brightness Temperature(K)

Inner Beam(HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	0	0
Max	344	345	297	292

Outer Beam(VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	0	0	0	0
Max	342	336	316	303

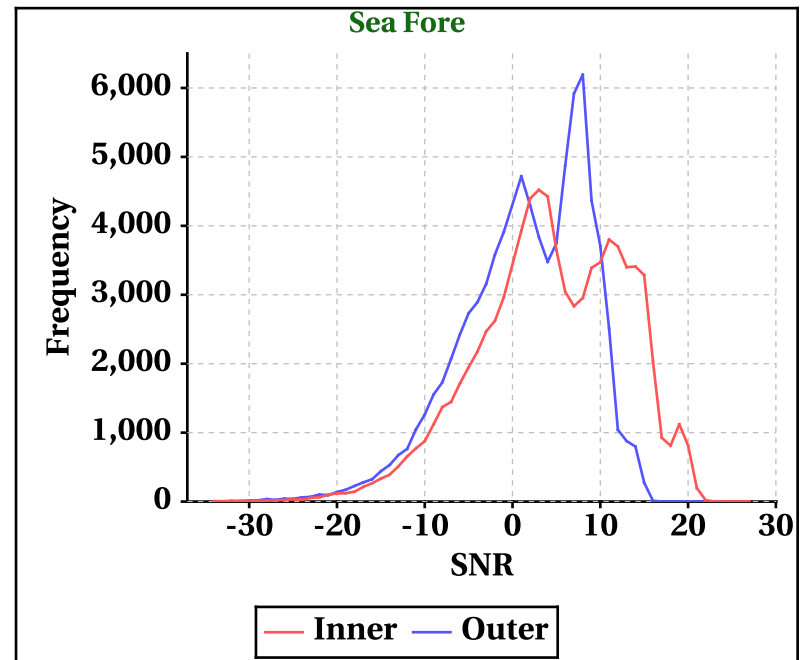
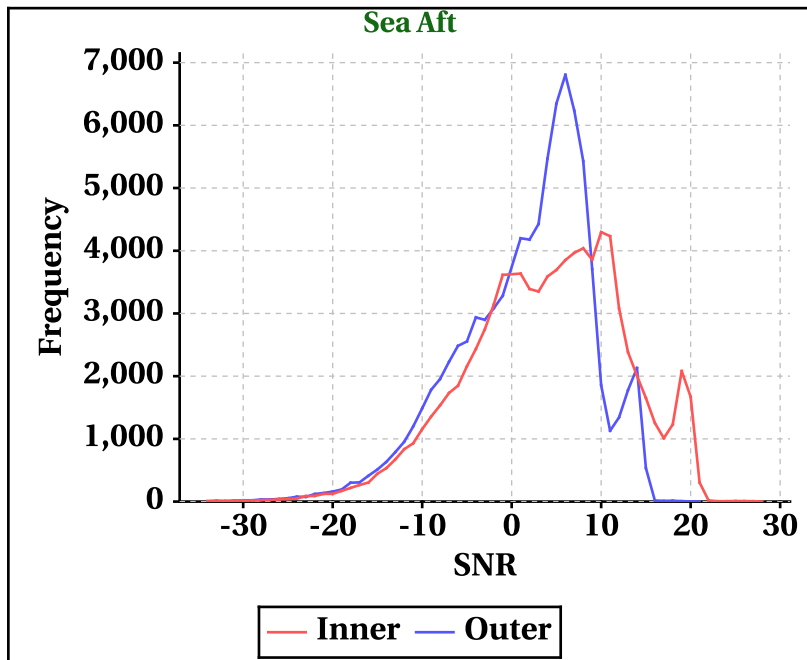
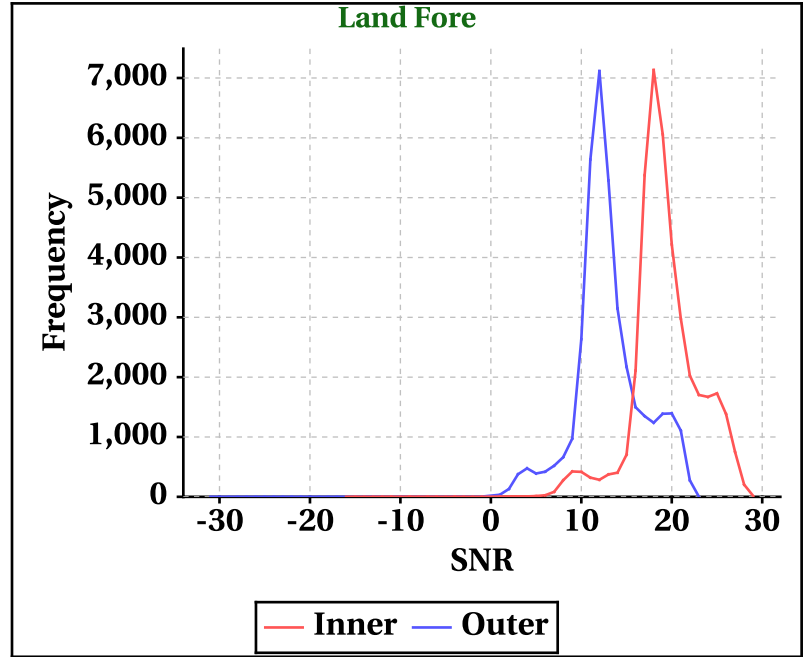
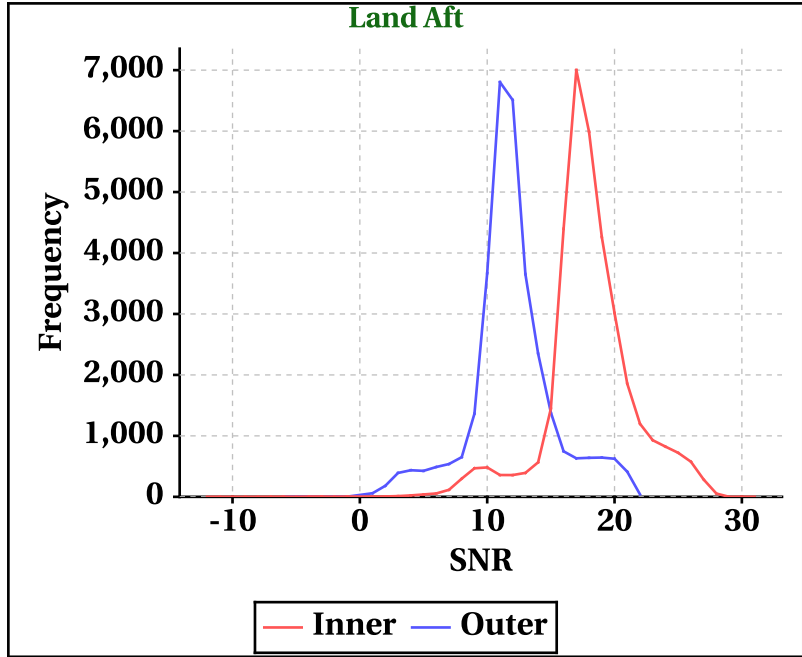


# Dynamic Range (Data Histograms)

## SNR(dBm)

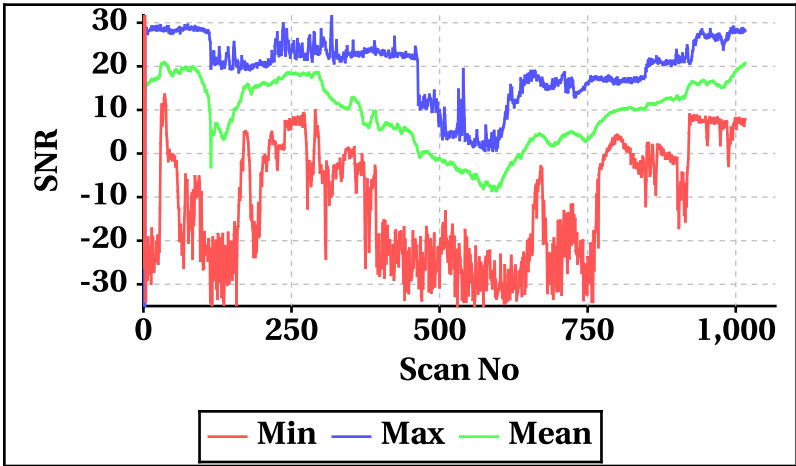
Inner Beam (HH)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-12	-16	-34	-34
Max	31	29	28	27

Outer Beam (VV)				
	Land Aft	Land Fore	Sea Aft	Sea Fore
Min	-6	-31	-34	-34
Max	22	23	21	22

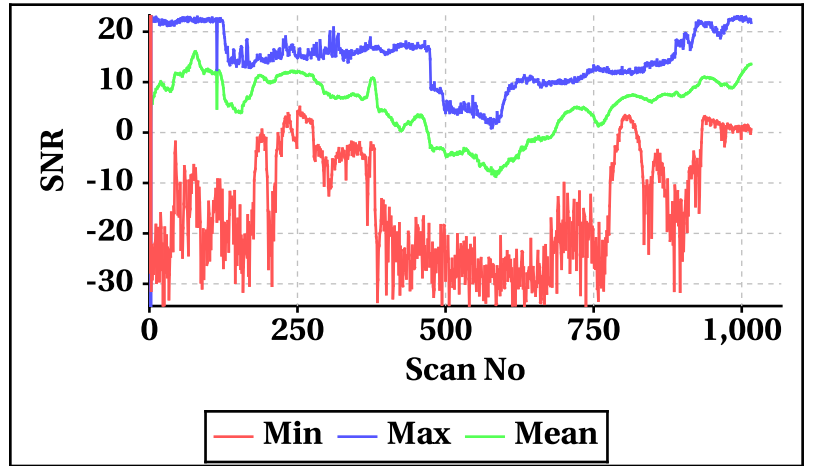


## Orbit-wise behaviour of SNR

Inner Beam (HH)

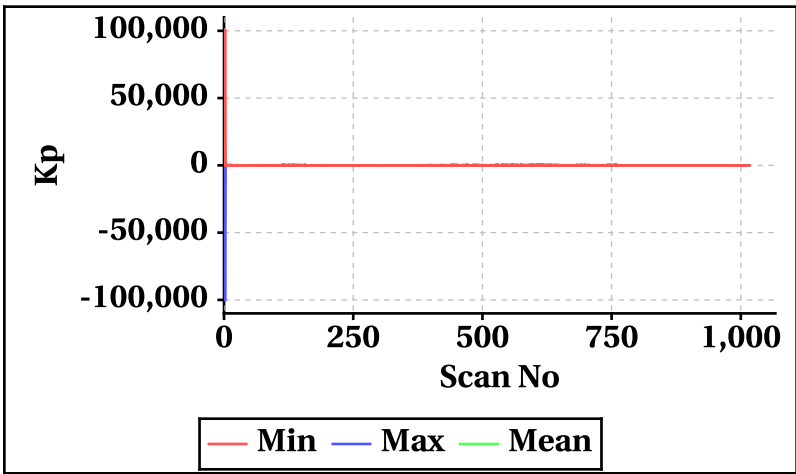


Outer Beam(VV)

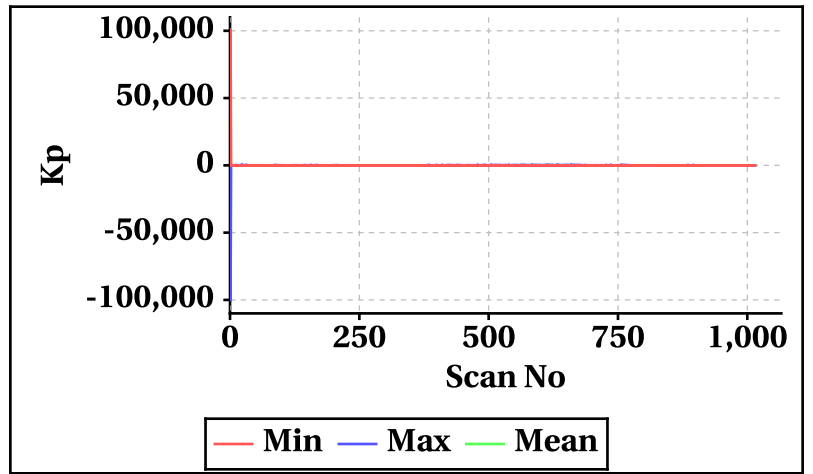


## Orbit-wise behaviour of Kp,Kpa,Kpb,Kpc

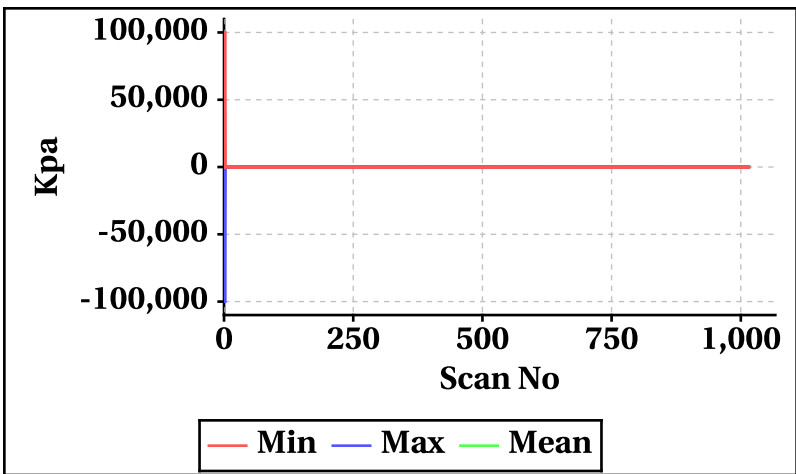
Inner Beam(HH)



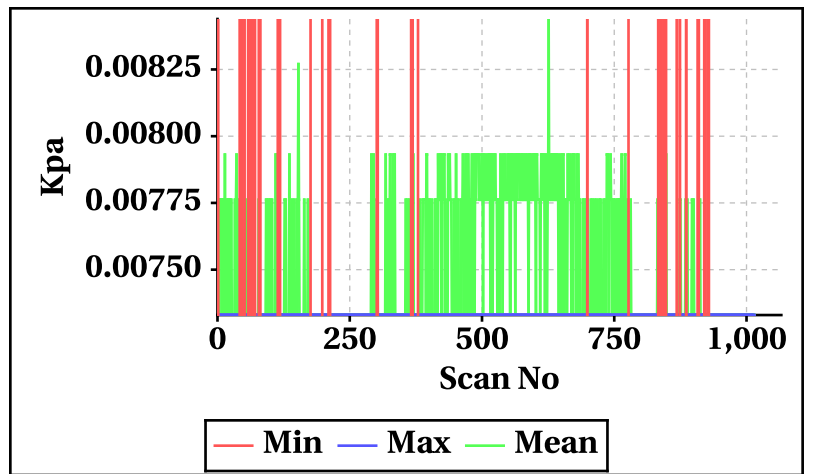
Outer Beam(VV)



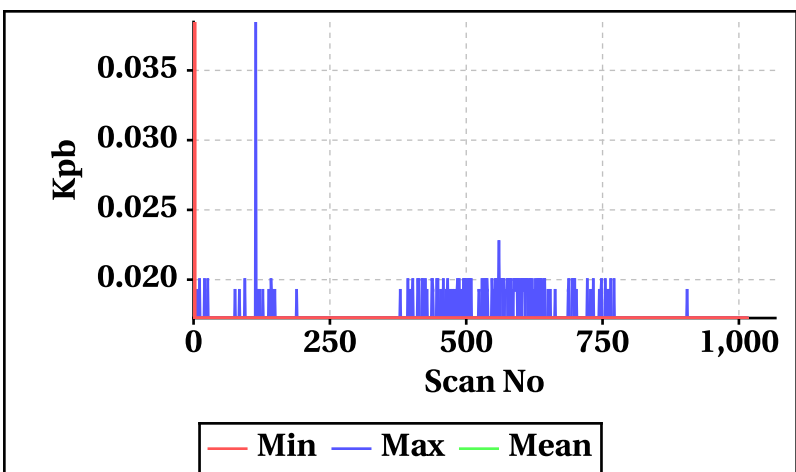
Inner Beam(HH)



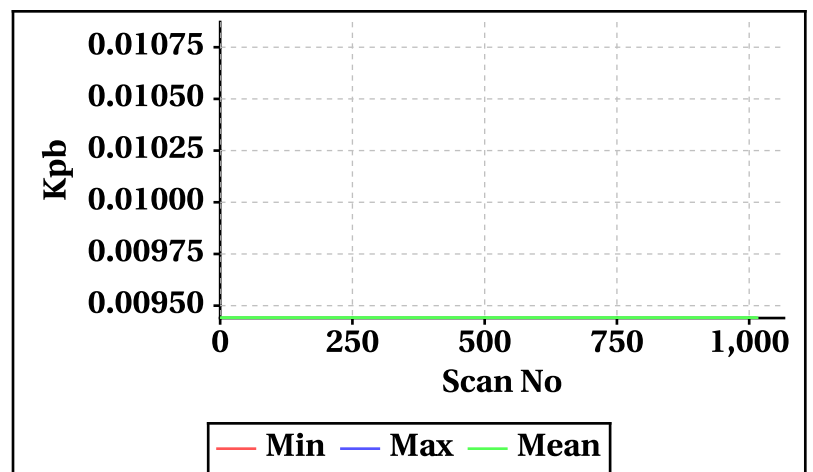
Outer Beam(VV)



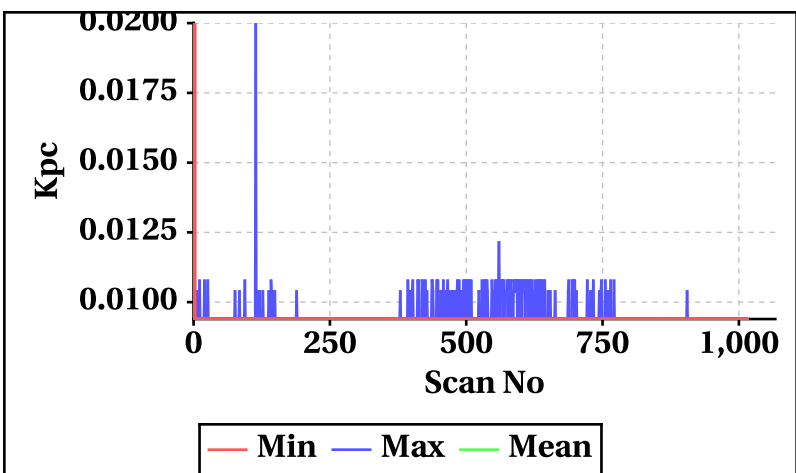
Inner Beam(HH)



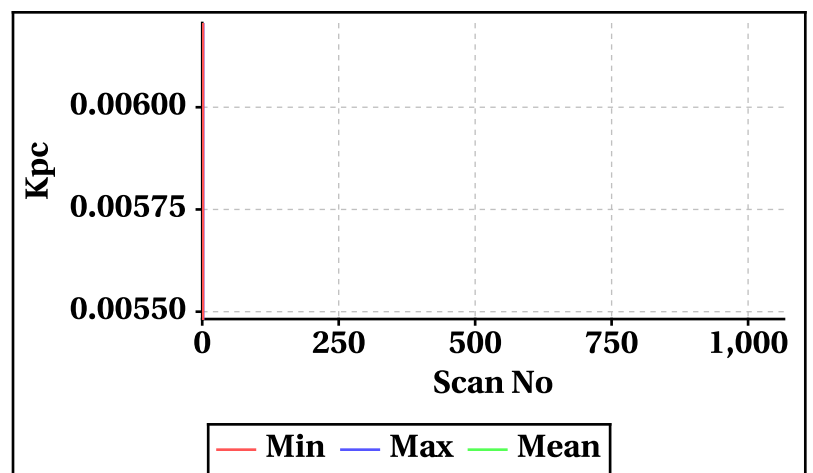
Outer Beam(VV)



Inner Beam(HH)



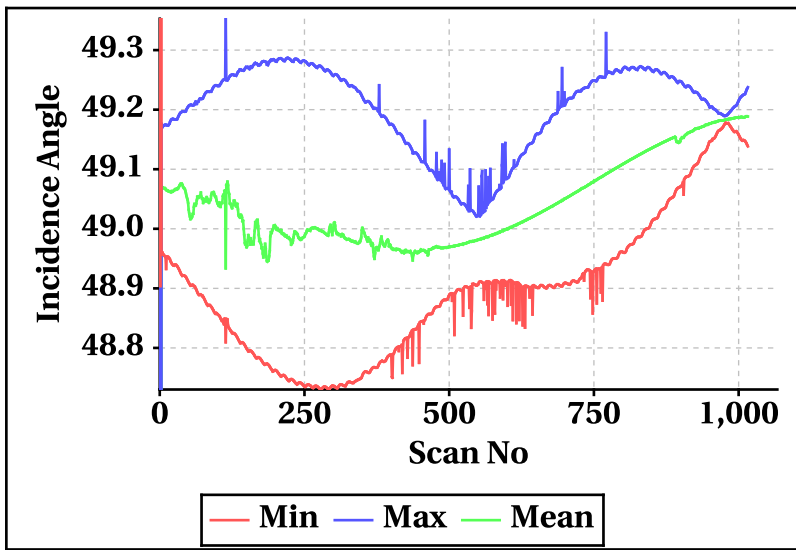
Outer Beam(VV)



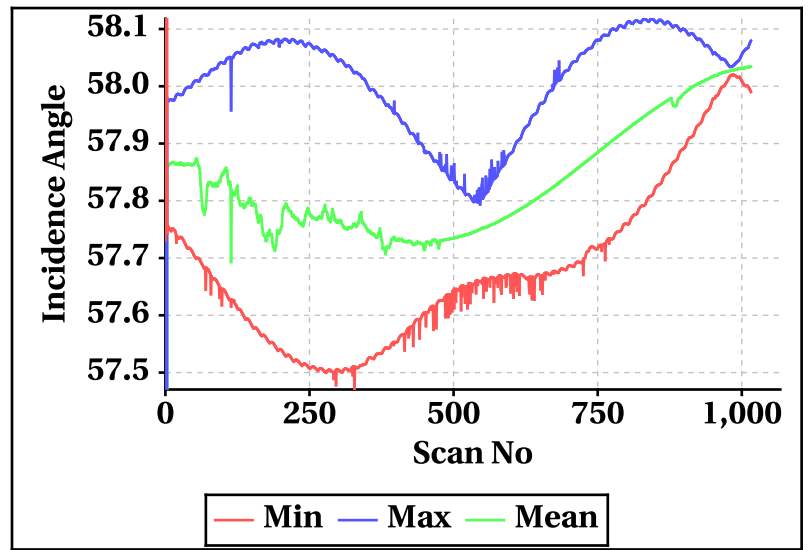


Orbit-wise behaviour of Incidence, Azimuth, Range, X-Factor

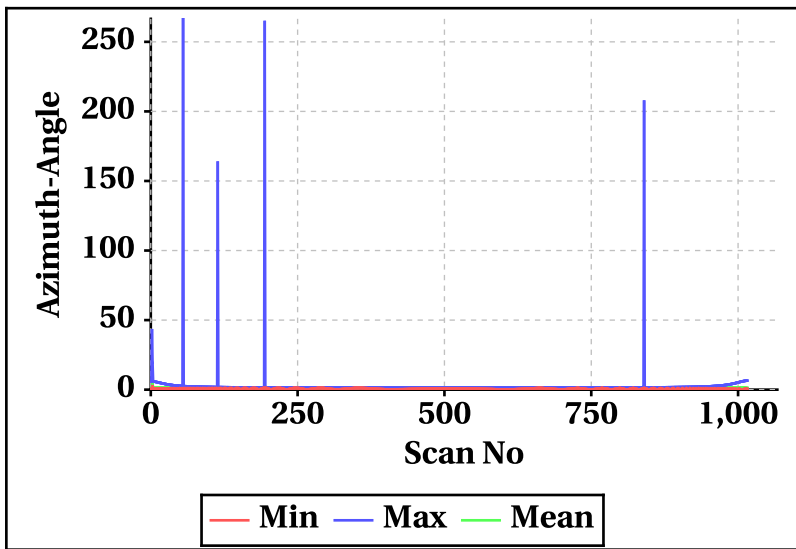
Inner Beam (HH)



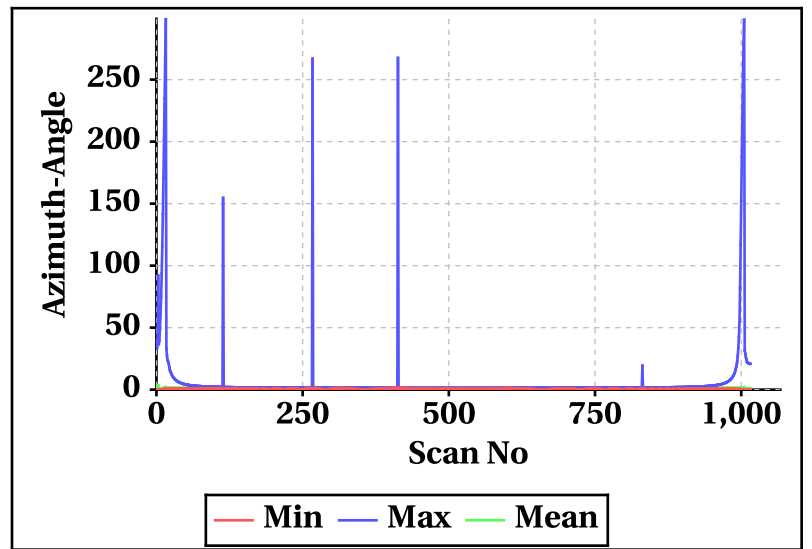
Outer Beam(VV)



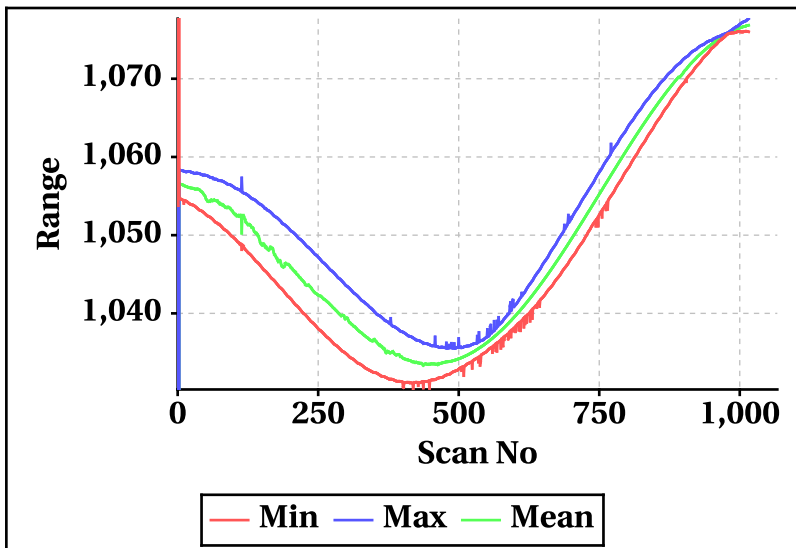
Inner Beam (HH)



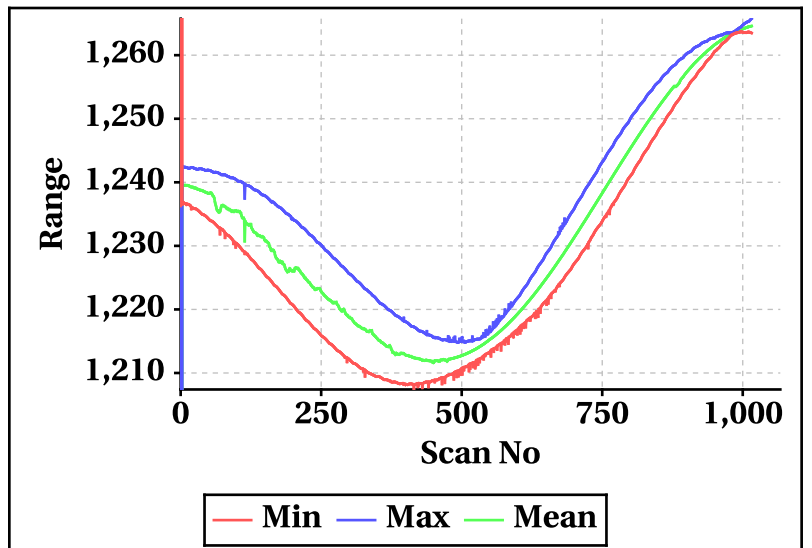
Outer Beam(VV)



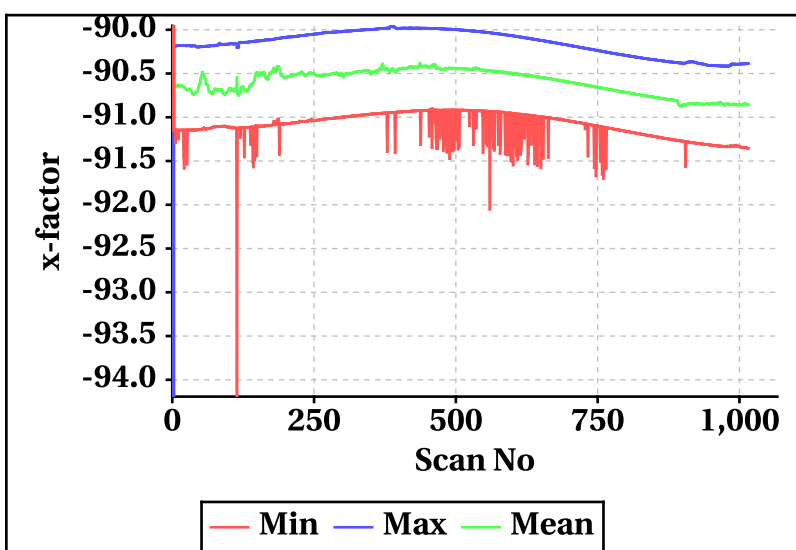
Inner Beam (HH)



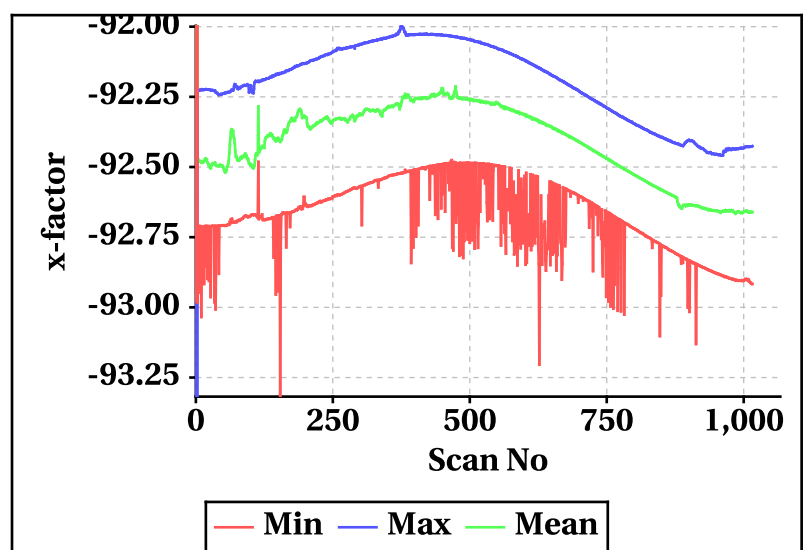
Outer Beam(VV)



Inner Beam (HH)



Outer Beam(VV)

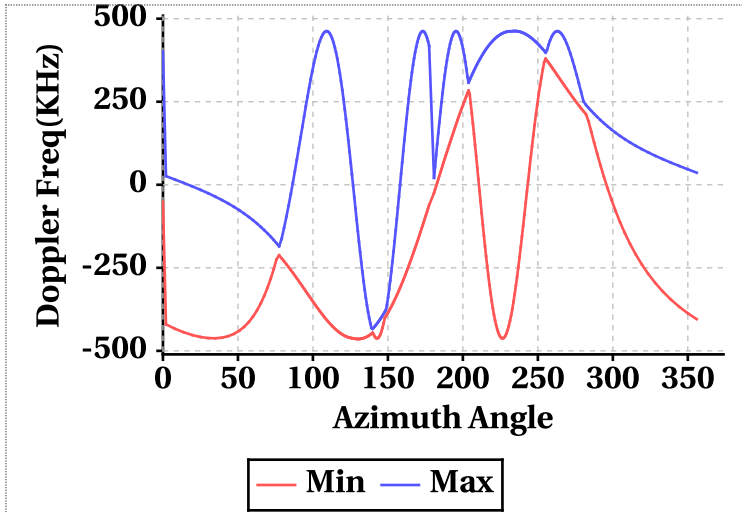


# Doppler Frequency Variation

Doppler Frequency(KHz) variation statistics Over the half Orbit

	Inner Beam (HH)	Outer Beam (VV)
Min	-464.26	-520.12
Max	462.72	518.74

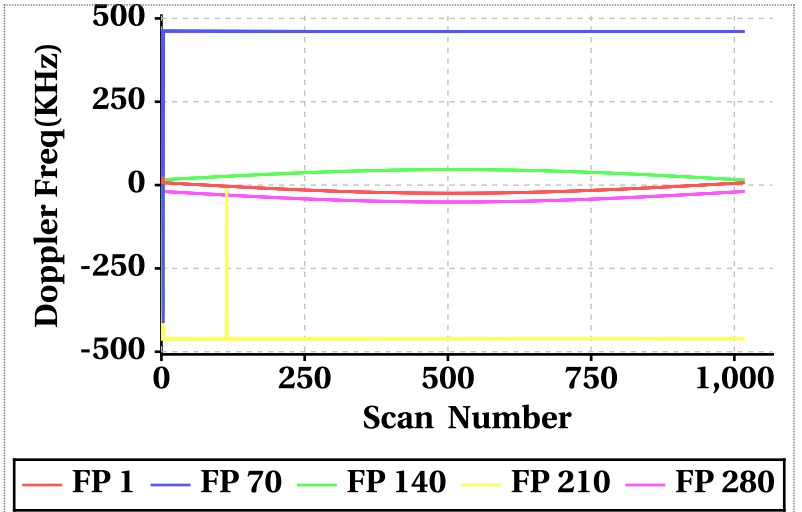
Footprint wise Doppler frequency variation Inner Beam (HH)



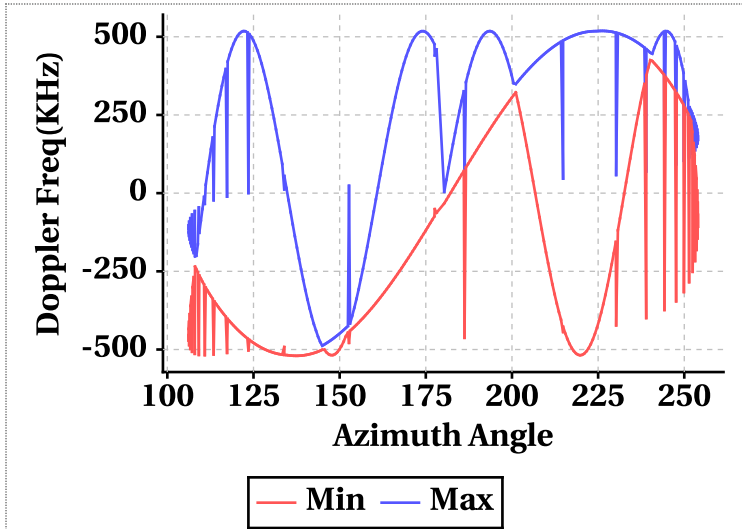
Doppler Frequency(KHz) variation

Doppler_FP	Inner Beam (HH)			Outer Beam (VV)		
	Min	Max	Mean	Min	Max	Mean
Doppler_1	-24.48	20.92	-12.88	-32.90	4.26	-19.95
Doppler_70	-409.82	462.04	459.71	-467.86	517.68	514.96
Doppler_140	-386.94	46.54	34.76	-443.94	46.48	33.24
Doppler_210	-461.74	31.70	-459.81	-517.72	16.14	-515.70
Doppler_280	-51.10	401.88	-38.85	-51.22	440.50	-37.57

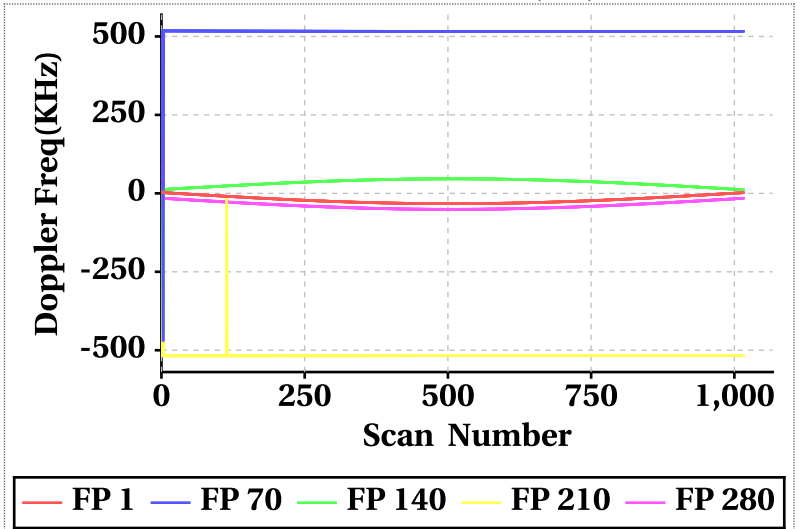
Doppler frequency variation at footprints: 1, 70, 140, 210 & 280 Inner Beam (HH)



Footprint wise Doppler frequency variation Outer Beam (VV)

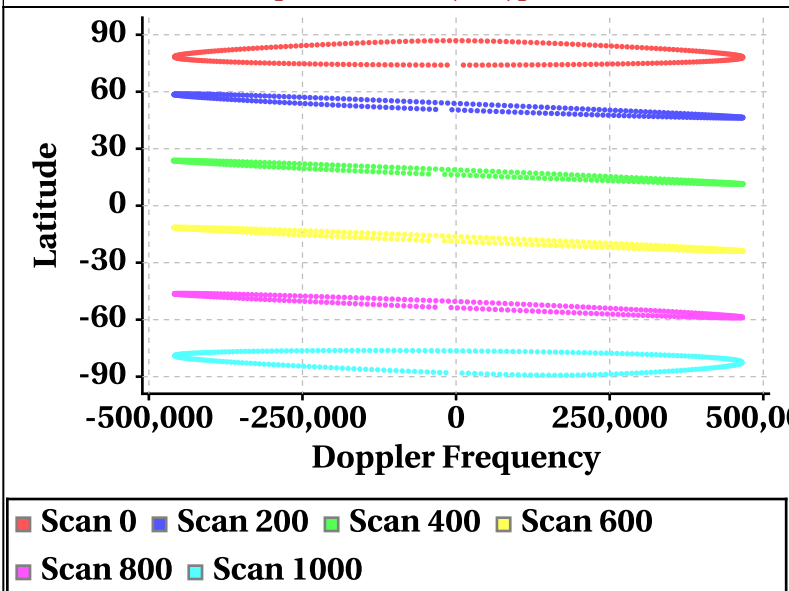


Doppler frequency variation at footprints: 1, 70, 140, 210 & 280 Outer Beam (VV)

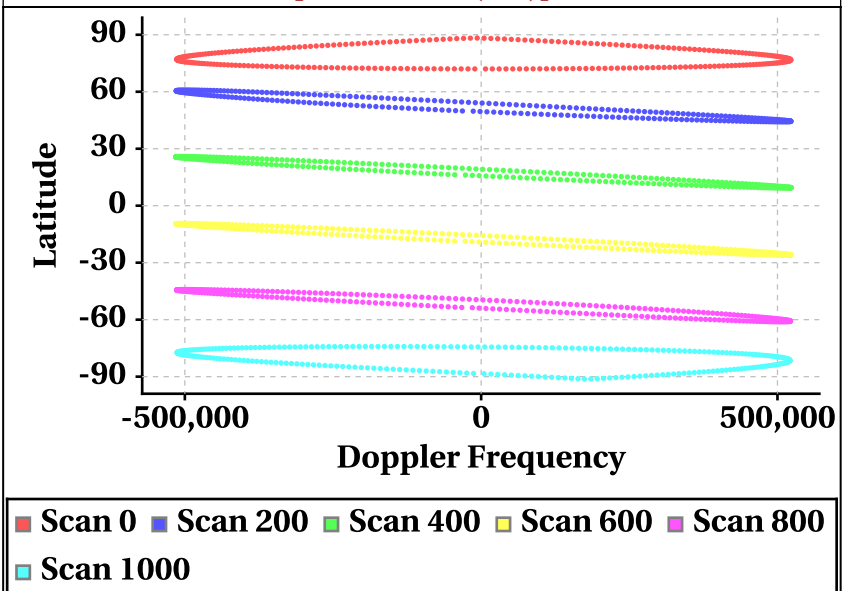


# Latitude Vs Doppler Frequency

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



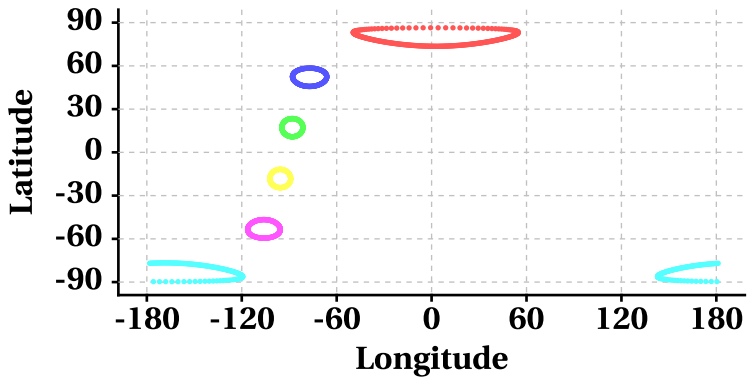
Doppler Frequency at Scan Interval of 200 [Outer Beam(VV)]



# Parameter as a function of Latitude

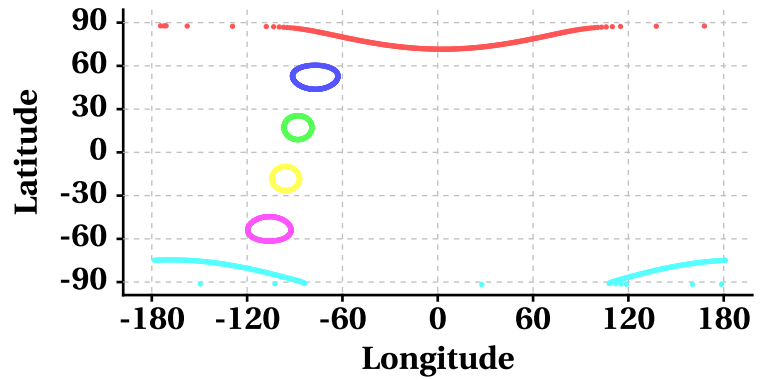
## Latitude Vs Longitude

Scan Trace [Inner Beam(HH)]



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

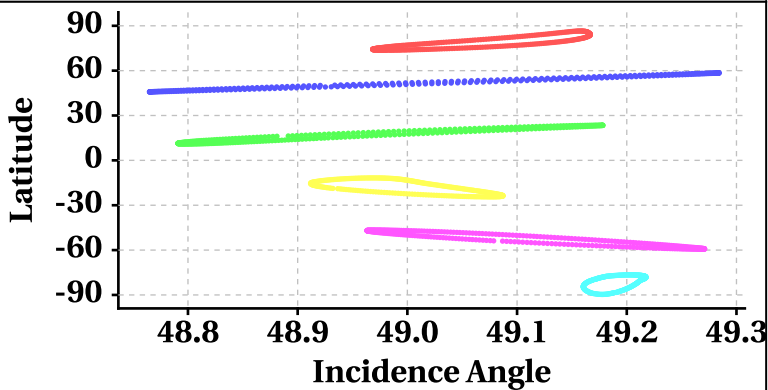
Scan Trace [Outer Beam (VV)]



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

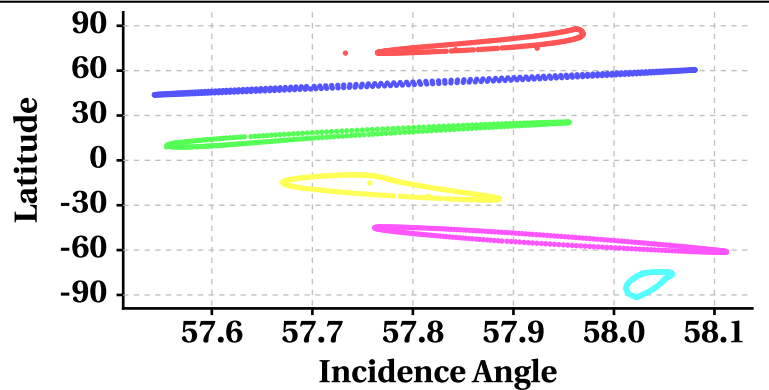
## Latitude Vs Incidence Angle

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



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

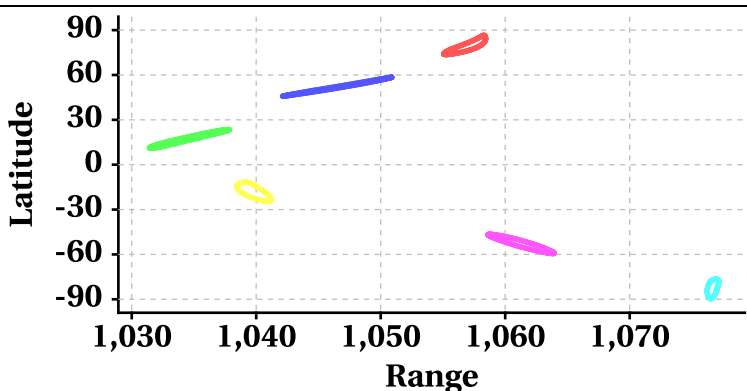
Incidence Angle at Scan Interval of 200 [Outer Beam (VV)]



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

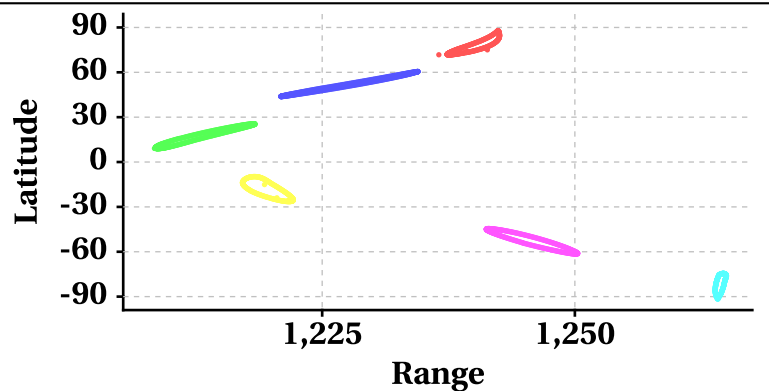
## Latitude Vs Range

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

