

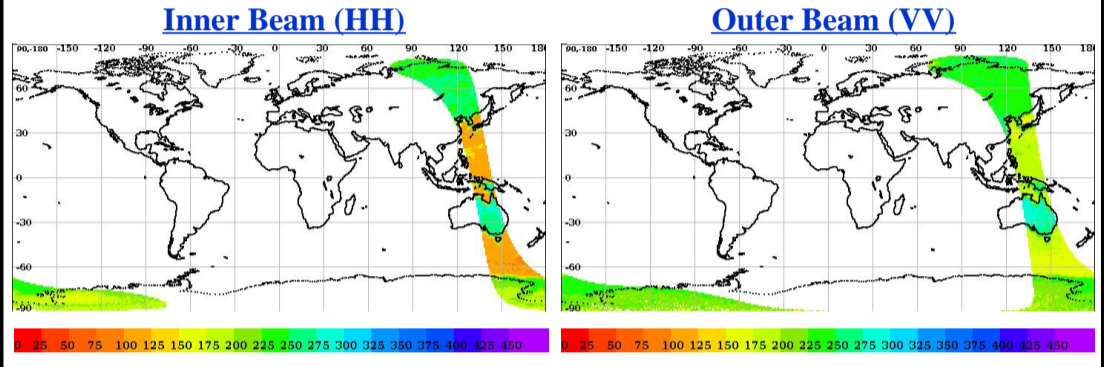
# SCATSAT-1 Scatterometer Level-1B Data Quality Evaluation Report

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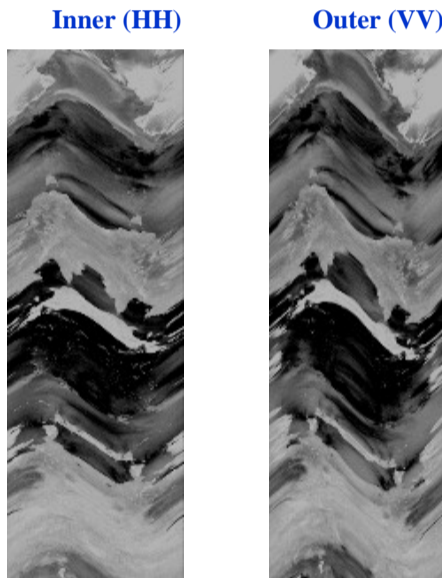
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|                              |               |                              |              |                               |     |
|------------------------------|---------------|------------------------------|--------------|-------------------------------|-----|
| <b>Satellite Id</b>          | ScatSat-1     | <b>Start Orbit</b>           | 16591        | <b>Total Scans</b>            | 943 |
| <b>Sensor Name</b>           | Scatterometer | <b>End Orbit</b>             | 16592        | <b>No of Inner FootPrints</b> | 281 |
| <b>Processor Version</b>     | v1.1.3        | <b>Rev. Number</b>           | 16591_16592  | <b>No Of Outer FootPrints</b> | 282 |
| <b>Half Orbit Direction</b>  | SN            | <b>Data Production Date</b>  | 14-11-2019   | <b>No. Of Inner Slices</b>    | 9   |
| <b>Equator Crossing Date</b> | 14-11-2019    | <b>Equator Crossing Time</b> | 11:22:52.000 | <b>No Of Outer Slices</b>     | 15  |

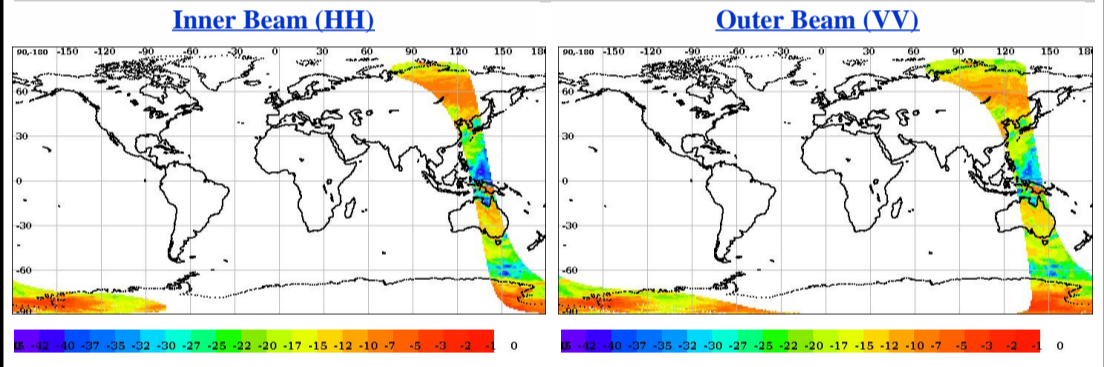
## Brightness Temperature(k) Footprint trace



## Image Snapshot for Inner & Outer Beam



## Sigma0(dB) Footprint trace



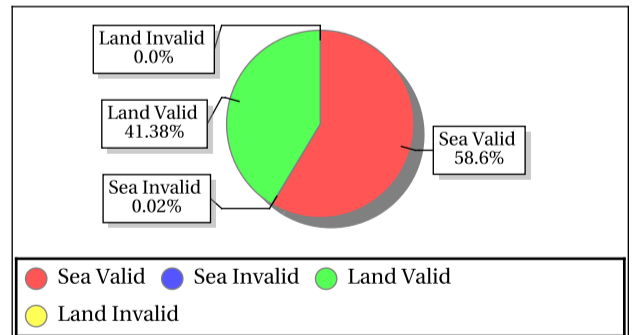
## Invalid and Poor Sigma-0 Quality Flag Statistics for Inner/Outer Slices\*

| Sigma-0 Flags                            | Inner Beam | Outer Beam |
|--|------------|------------|
| Invalid Sigma0(%)                        | 0.02       | 0.02       |
| 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(%)                           | 22.22      | 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 (%)                         | 0.043395   | 0.101092   |

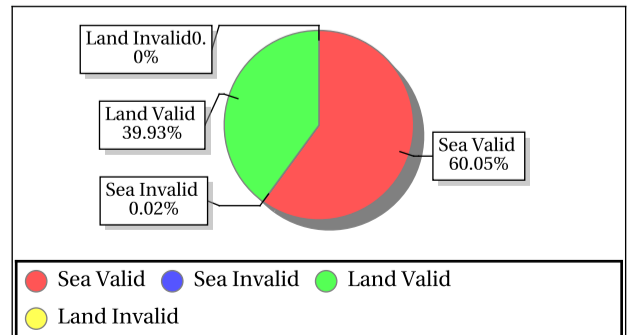
\*DP Format Document

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

### Inner Beam (HH)



### Outer Beam (VV)



## 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    | 290.42 | 0.48 | 5.214        | 0.12     | 287.35 | 0.46 | 4.825        | 0.12     | 0.17  | 0.12  | 0.000        | 0.12      | 0.16  | 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>      | -34.77  | 23.79  | 3.99 | 0.003        | -34.72   | 22.03  | 4.49 | 0.003        | 2.13     | 32.33 | 17.69 | 8.977        | 2.33      | 32.10 | 18.47 | 10.671       |

| 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    | 213.40 | 0.40 | 4.055        | 0.09     | 234.60 | 0.37 | 3.658        | 0.09     | 0.18  | 0.09  | 0.000        | 0.09      | 0.18  | 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>      | -34.60  | 15.30  | 1.83 | 0.000        | -34.90   | 15.78  | 1.62 | 0.000        | -1.39    | 22.70 | 12.09 | 0.042        | -1.63     | 22.91 | 12.48 | 0.182        |

| 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> | 48.81           | 49.43   | 49.06   | 0.000        | 57.59           | 58.28   | 57.96   | 0.000        | Inci.(Inner)             | 47.10   | 49.90   |
| <b>Azimuth Diff. (deg)</b>   | 0.0027          | 6.41    | 1.27    | 1.652        | 0.0000          | 288.46  | 1.27    | 2.822        | Inci.(Outer)             | 57.30   | 58.90   |
| <b>Range(Km)</b>             | 1040.59         | 1076.82 | 1055.36 | 0.000        | 1219.27         | 1265.26 | 1240.55 | 0.000        | Azimuth Diff.            | 0.60    | 2.00    |
| <b>X Factor(dbm)</b>         | -91.83          | -90.07  | -90.60  | 0.000        | -93.18          | -92.12  | -92.35  | 0.000        | Range(Inner)             | 1025.00 | 1095.70 |
| <b>Across Distance (Km)</b>  | 15.52           | 16.11   | 15.79   | 0.000        | 20.52           | 21.11   | 20.77   | 0.000        | Range(Outer)             | 1210.00 | 1280.00 |
| <b>Along Distance (Km)</b>   | 18.82           | 20.61   | 19.72   | 0.000        | 9.45            | 34.16   | 19.63   | 2.000        | 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   |
|                              |                 |         |         |              |                 |         |         |              |                          |         |         |

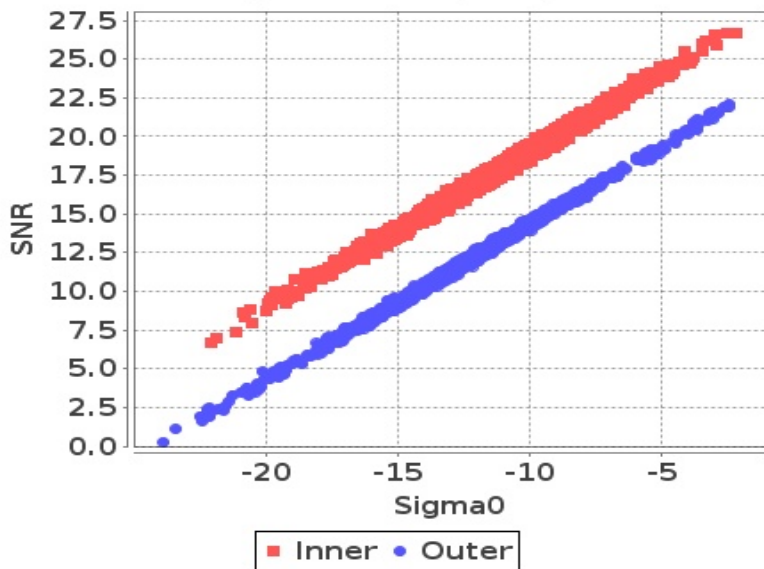
- Normal
- Deviations
- Alarming
- High Errors



## Sigma0 Behaviour (Sigma0 Vs SNR)

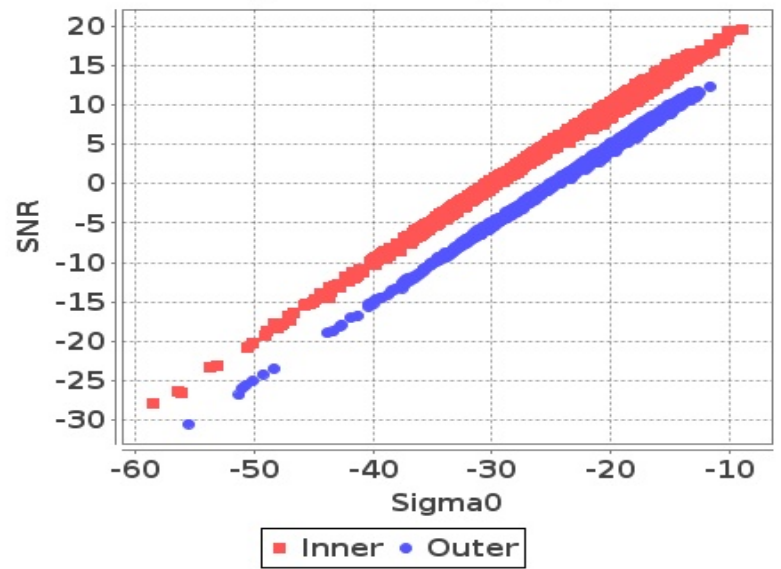
Footprint-Land

Sigma0 Vs SNR (Land)



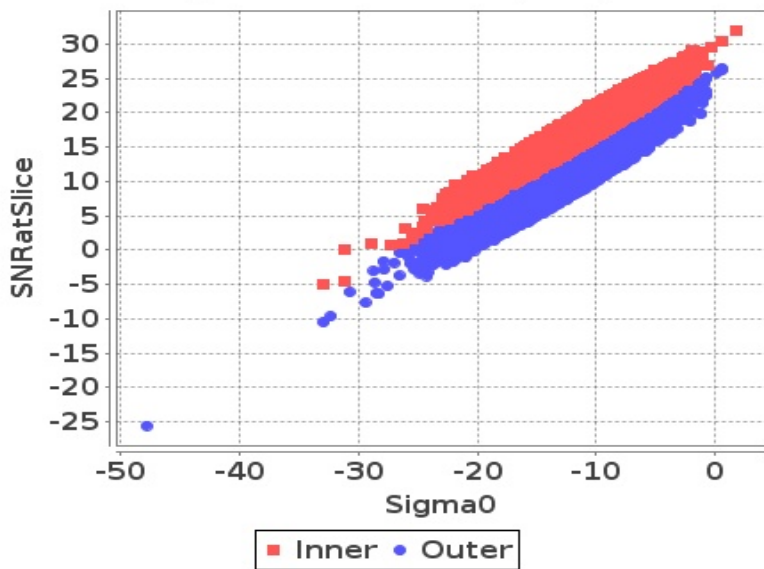
Footprint-Sea

Sigma0 Vs SNR (Sea)



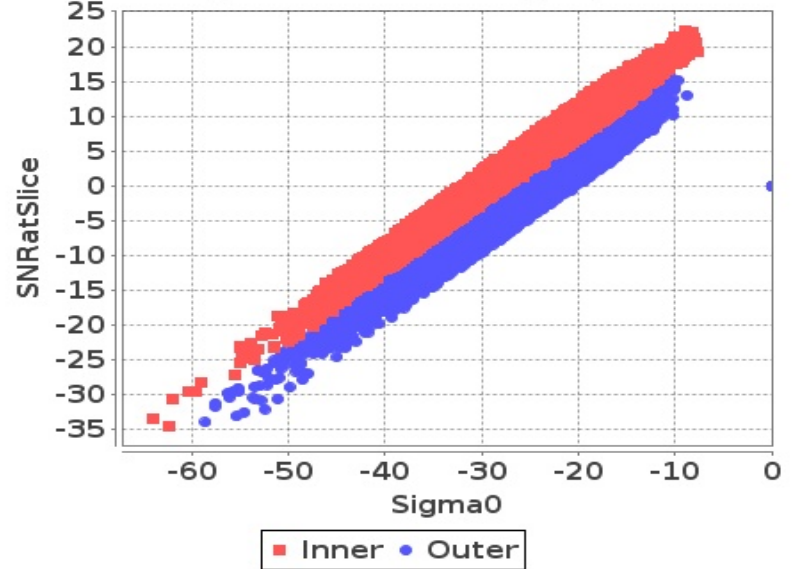
Slice-Land

Sigma0 Vs SNRatSlice (Land)



Slice-Sea

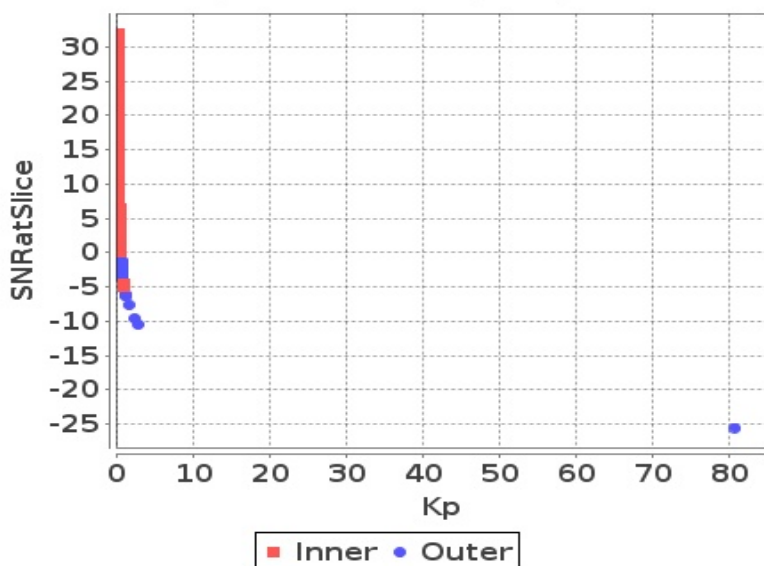
Sigma0 Vs SNRatSlice (Sea)



## Sigma0 Behaviour (Kp Vs SNR)

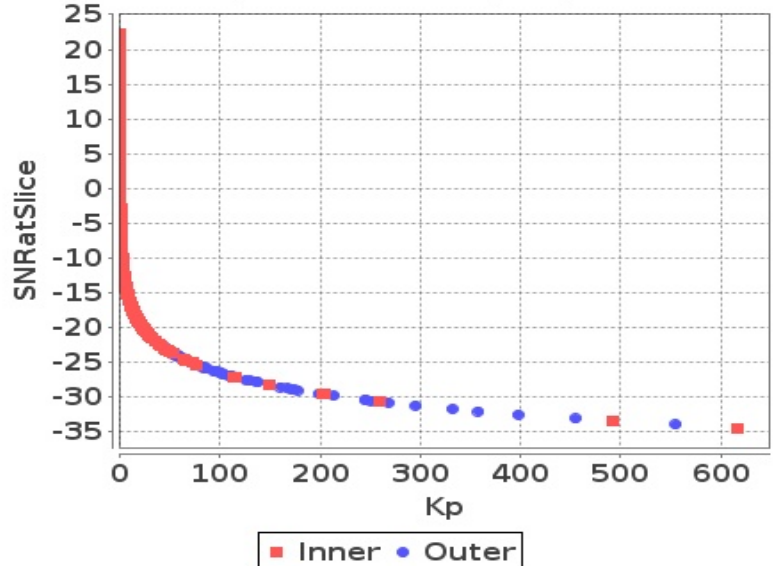
Slice

Kp Vs SNRatSlice (Land)



Slice

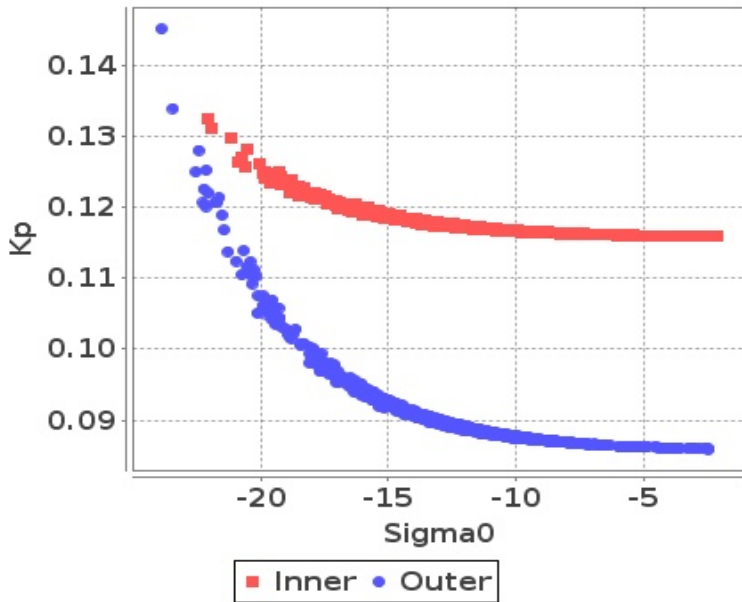
Kp Vs SNRatSlice (Sea)



# Sigma0 Behaviour(Sigma0 Vs Kp)

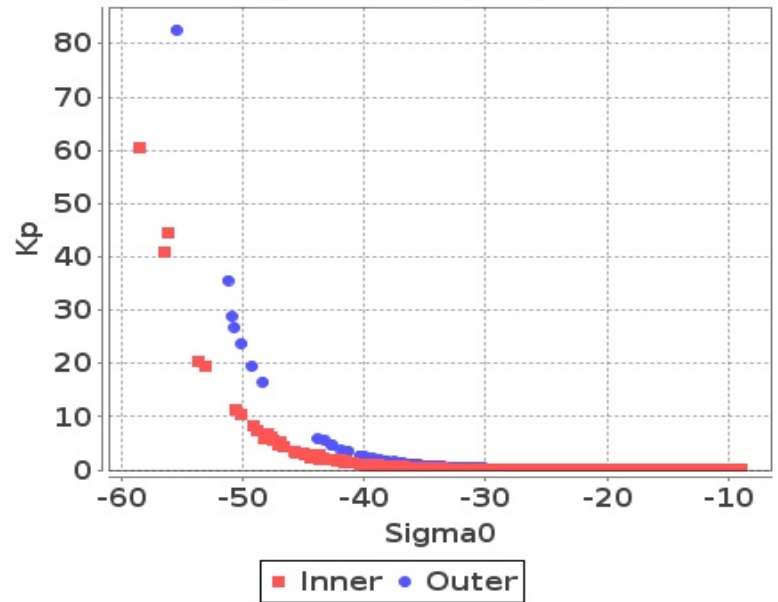
## Footprint-Land

### Sigma0 Vs Kp (Land)



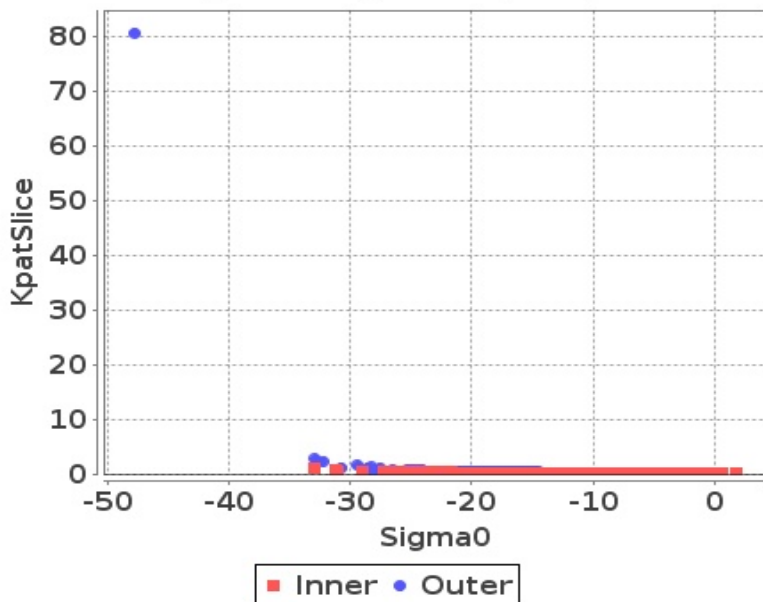
## Footprint-Sea

### Sigma0 Vs Kp (Sea)



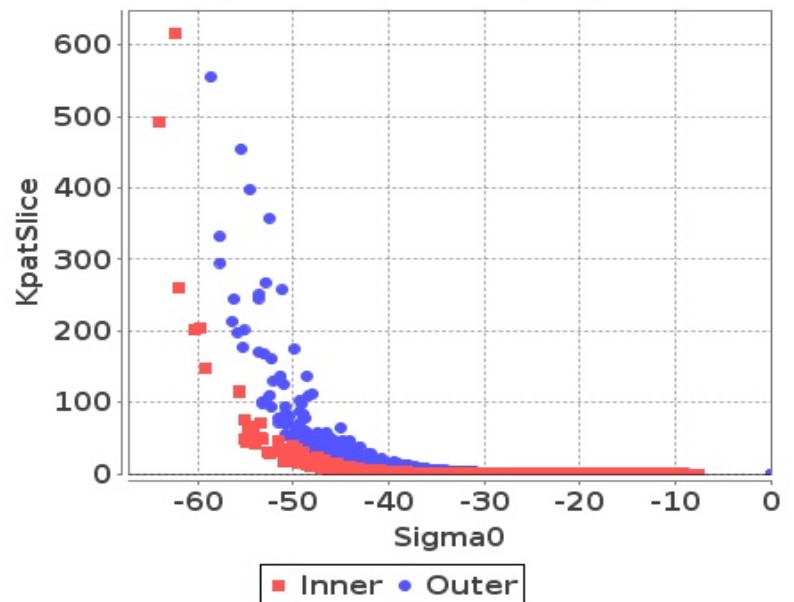
## Slice-Land

### Sigma0 Vs KpatSlice (Land)



## Slice-Sea

### Sigma0 Vs KpatSlice (Sea)

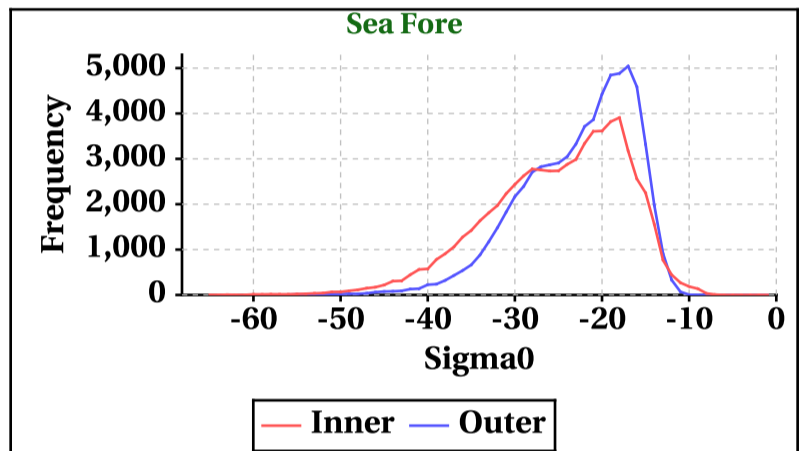
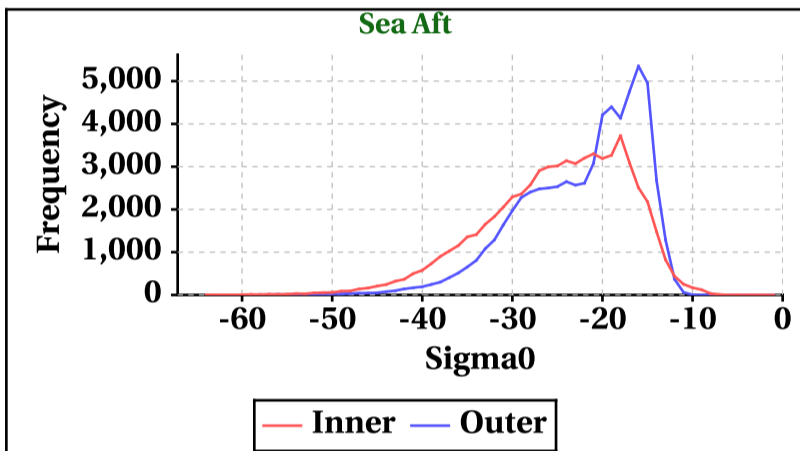
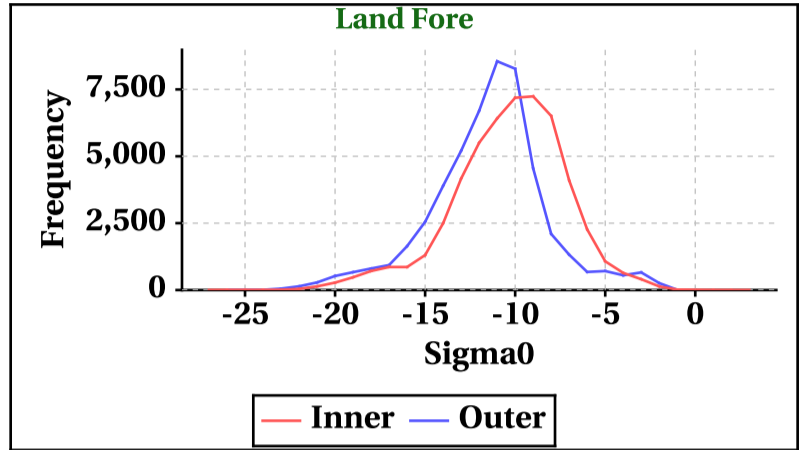
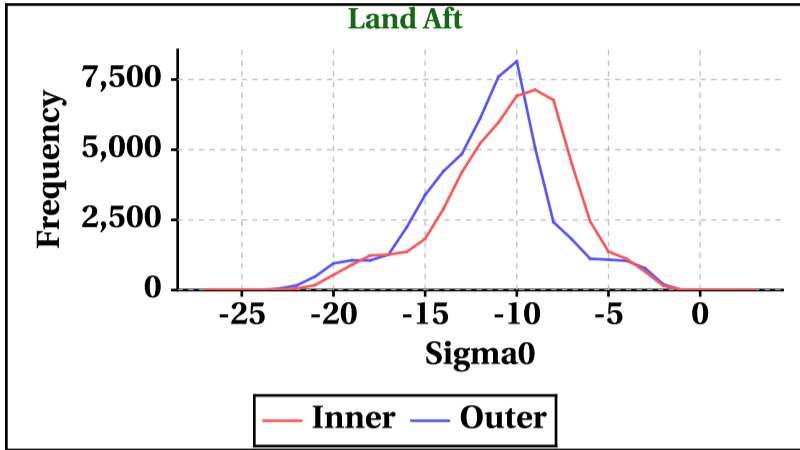


# Dynamic Range (Data Histograms)

## Sigma0(db)

| Inner Beam (HH) |          |           |         |          |
|-----------------|----------|-----------|---------|----------|
|                 | Land Aft | Land Fore | Sea Aft | Sea Fore |
| Min             | -27      | -27       | -64     | -65      |
| Max             | 3        | 3         | 0       | 0        |

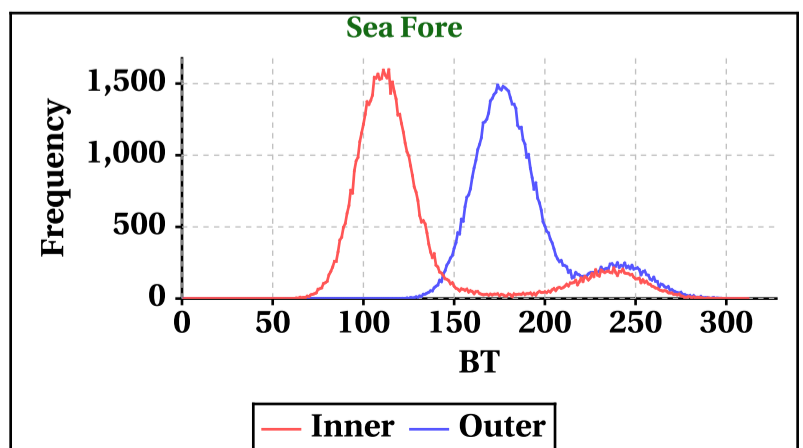
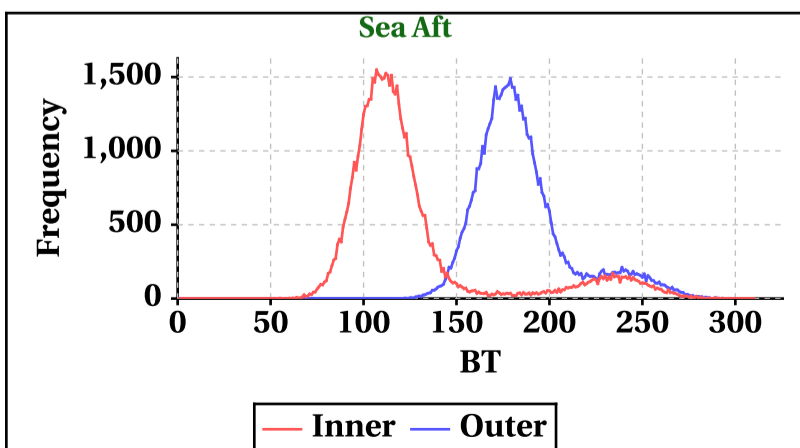
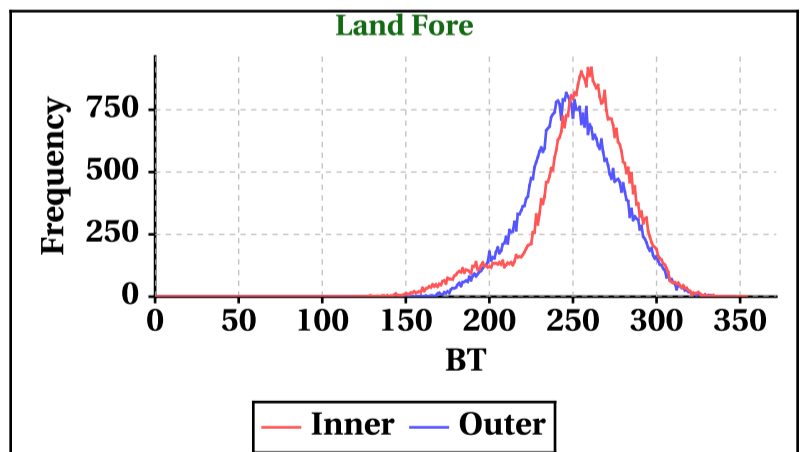
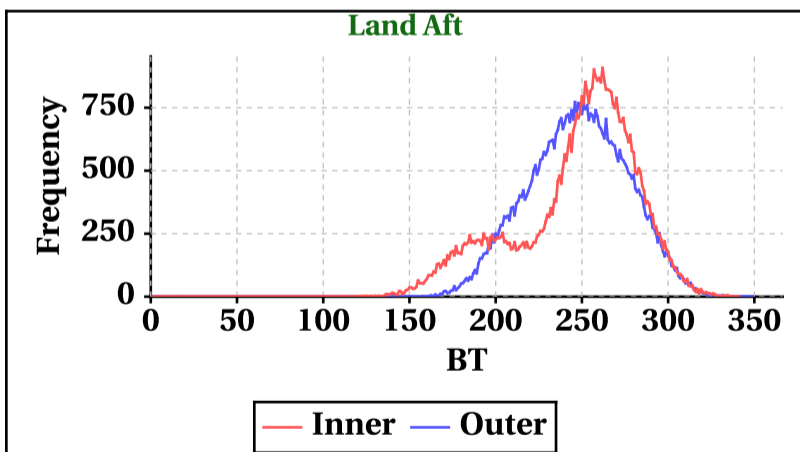
| Outer Beam (VV) |          |           |         |          |
|-----------------|----------|-----------|---------|----------|
|                 | Land Aft | Land Fore | Sea Aft | Sea Fore |
| Min             | -25      | -26       | -59     | -60      |
| Max             | 0        | 0         | 0       | 0        |



## Brightness Temperature(K)

| Inner Beam(HH) |          |           |         |          |
|----------------|----------|-----------|---------|----------|
|                | Land Aft | Land Fore | Sea Aft | Sea Fore |
| Min            | 0        | 0         | 0       | 0        |
| Max            | 341      | 354       | 310     | 312      |

| Outer Beam(VV) |          |           |         |          |
|----------------|----------|-----------|---------|----------|
|                | Land Aft | Land Fore | Sea Aft | Sea Fore |
| Min            | 0        | 0         | 0       | 0        |
| Max            | 349      | 347       | 301     | 311      |

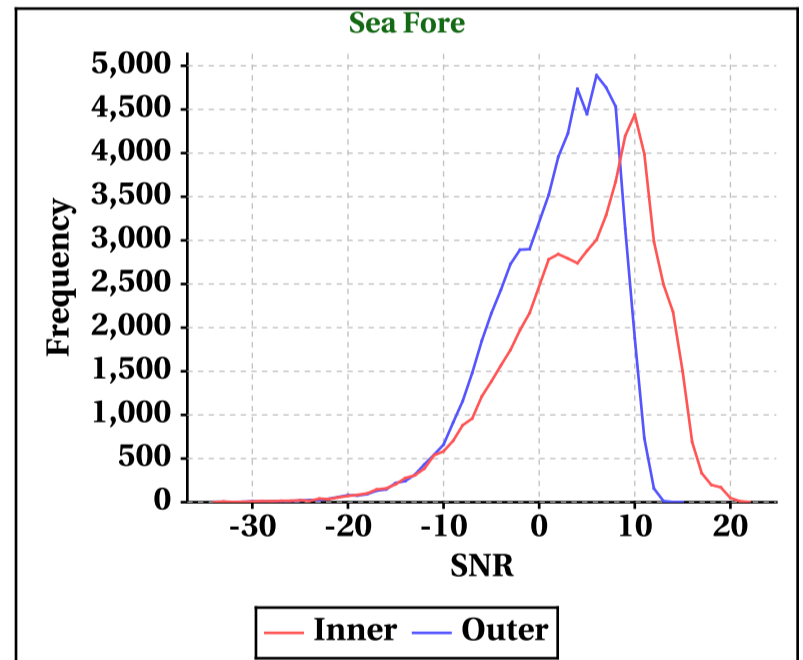
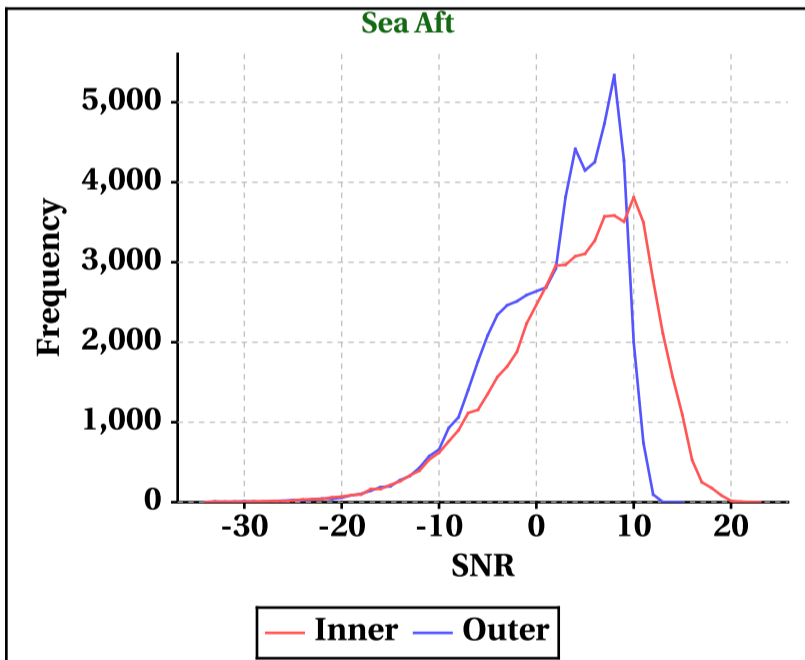
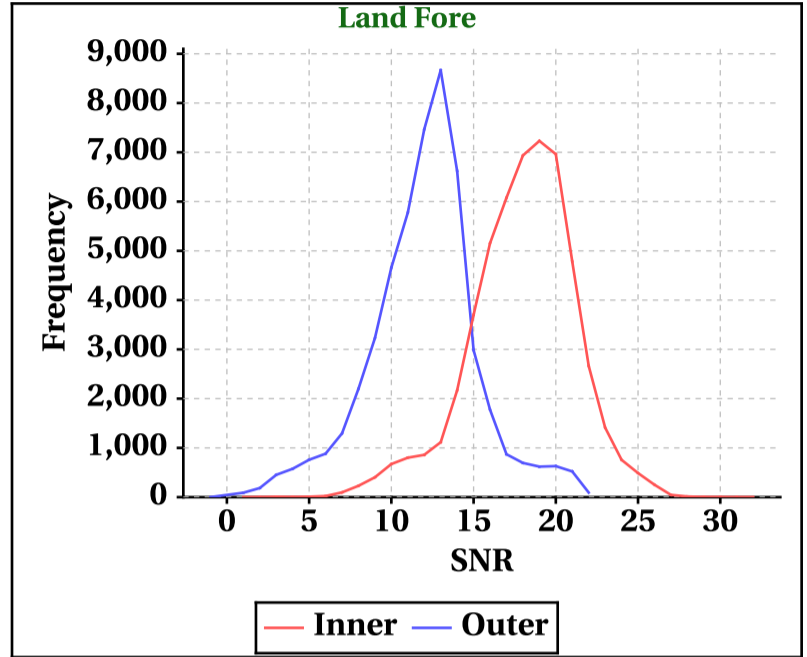
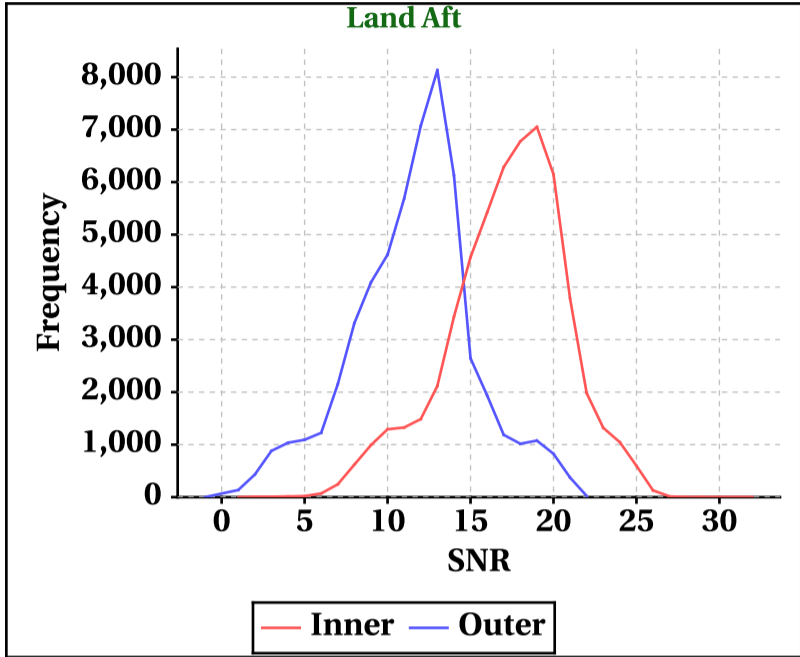


# Dynamic Range (Data Histograms)

## SNR(dBm)

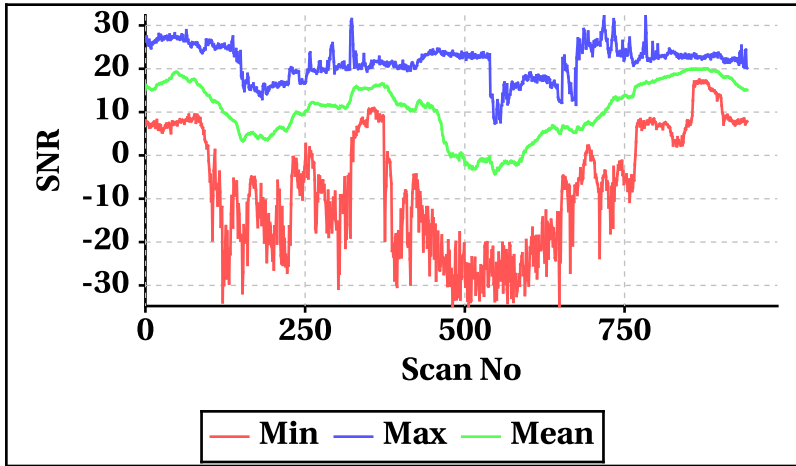
| Inner Beam (HH) |          |           |         |          |
|-----------------|----------|-----------|---------|----------|
|                 | Land Aft | Land Fore | Sea Aft | Sea Fore |
| Min             | 0        | 0         | -34     | -34      |
| Max             | 32       | 32        | 23      | 22       |

| Outer Beam (VV) |          |           |         |          |
|-----------------|----------|-----------|---------|----------|
|                 | Land Aft | Land Fore | Sea Aft | Sea Fore |
| Min             | -1       | -1        | -34     | -34      |
| Max             | 22       | 22        | 15      | 15       |

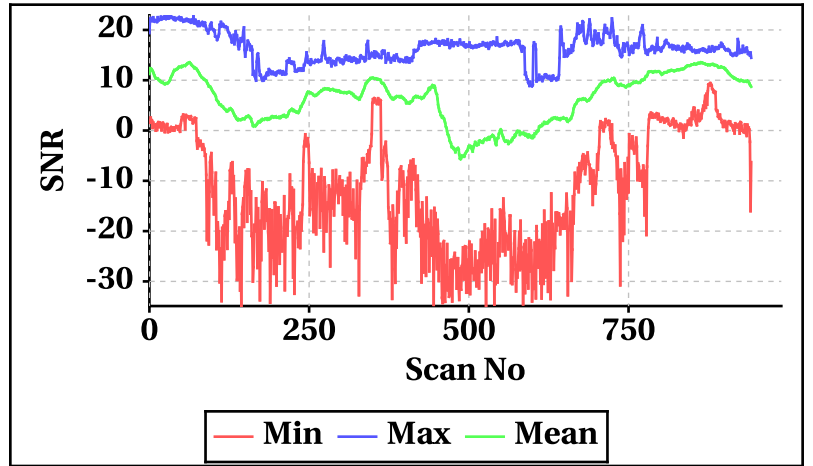


## Orbit-wise behaviour of SNR

Inner Beam (HH)

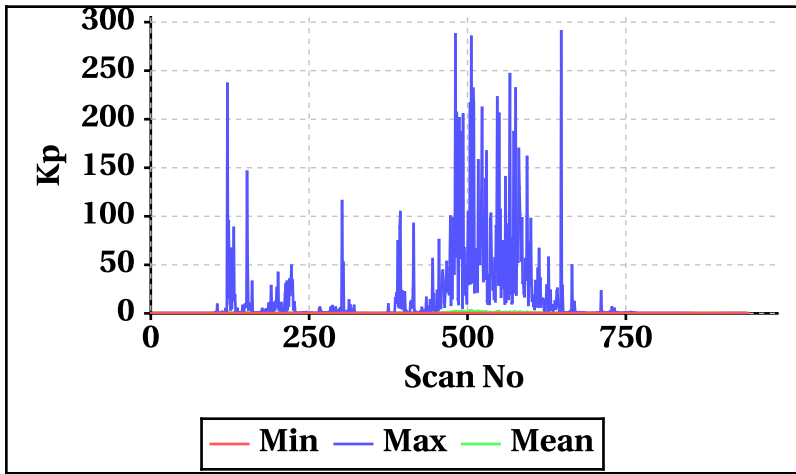


Outer Beam(VV)

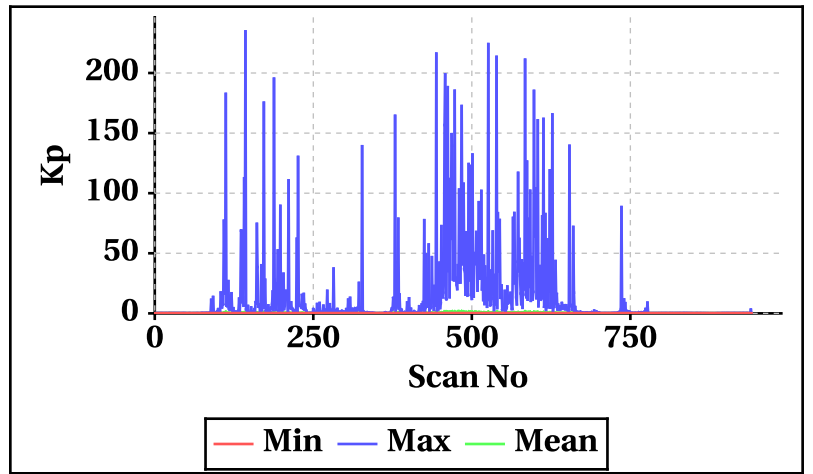


## Orbit-wise behaviour of Kp,Kpa,Kpb,Kpc

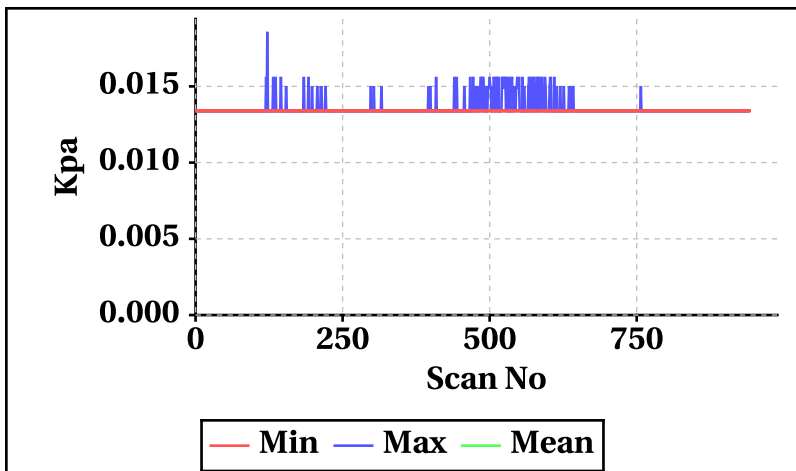
Inner Beam(HH)



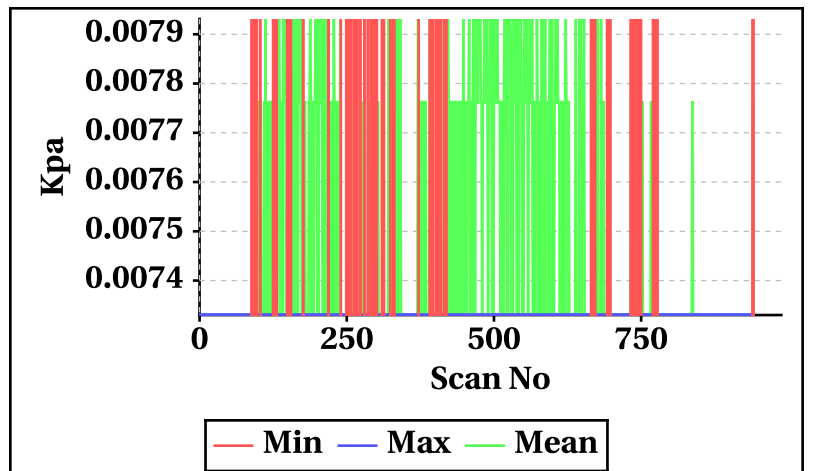
Outer Beam(VV)



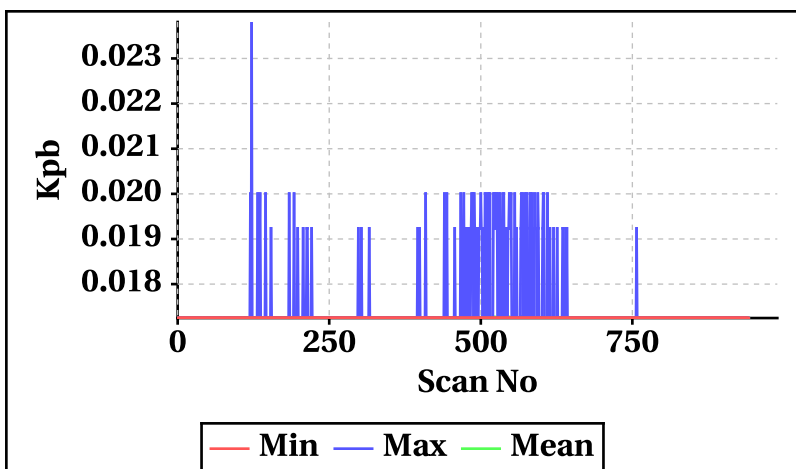
Inner Beam(HH)



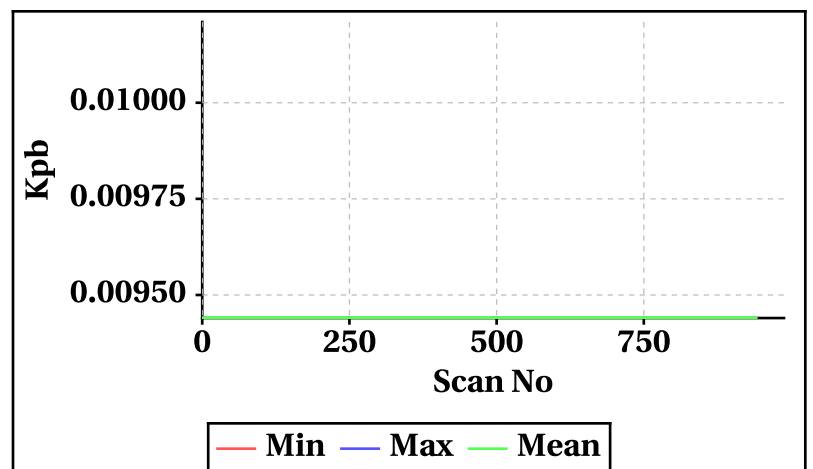
Outer Beam(VV)



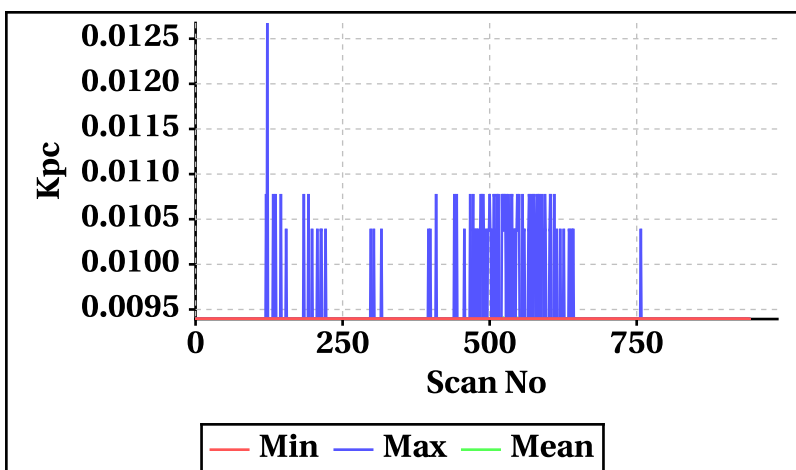
Inner Beam(HH)



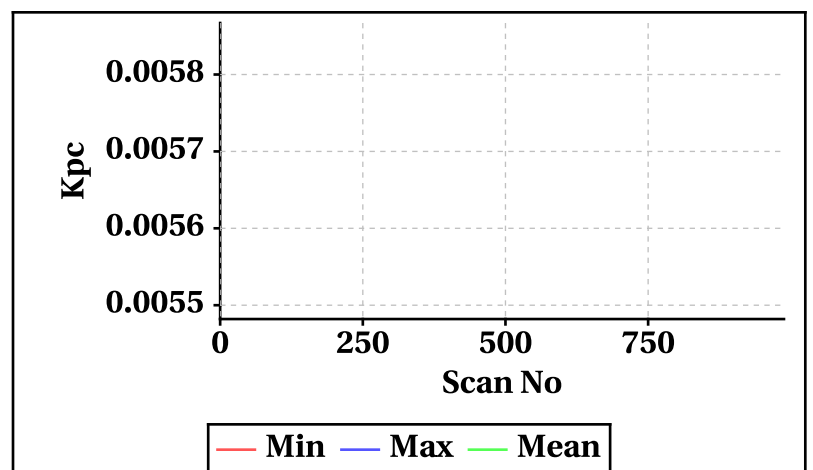
Outer Beam(VV)



Inner Beam(HH)

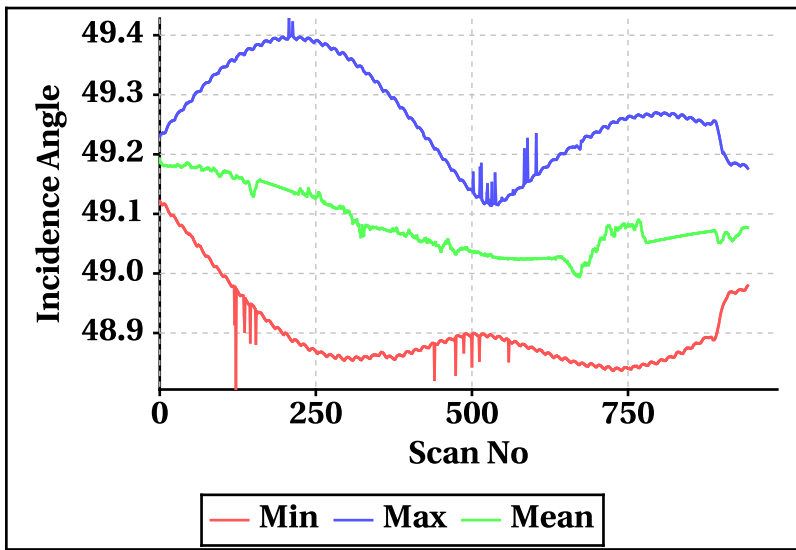


Outer Beam(VV)

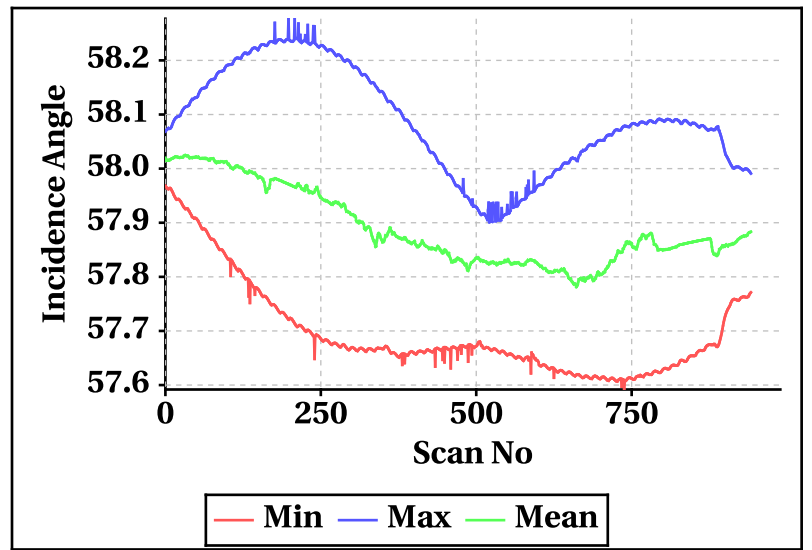


Orbit-wise behaviour of Incidence, Azimuth, Range, X-Factor

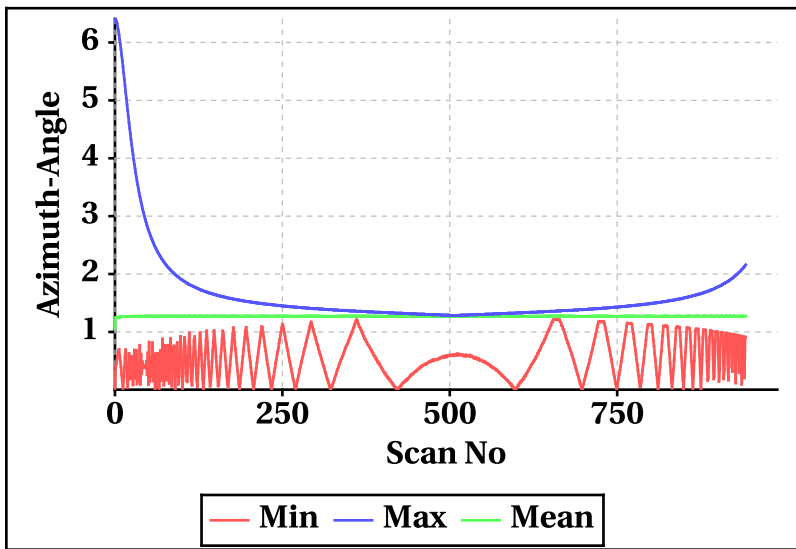
Inner Beam (HH)



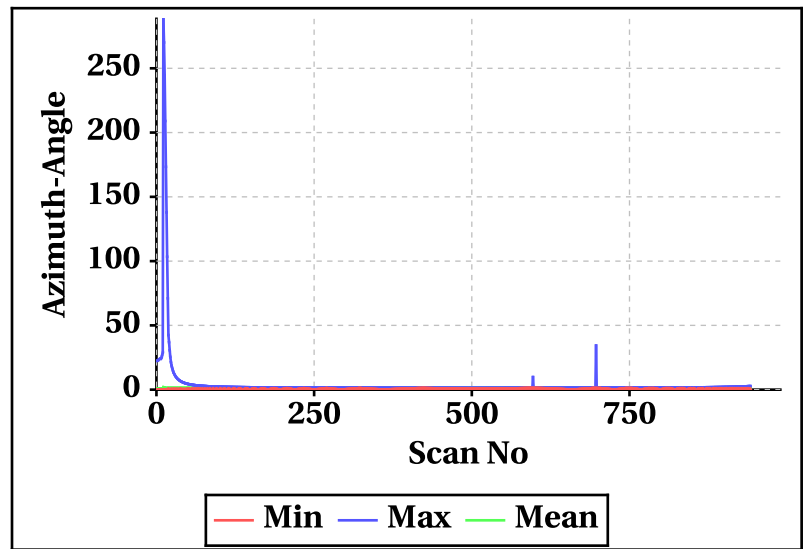
Outer Beam(VV)



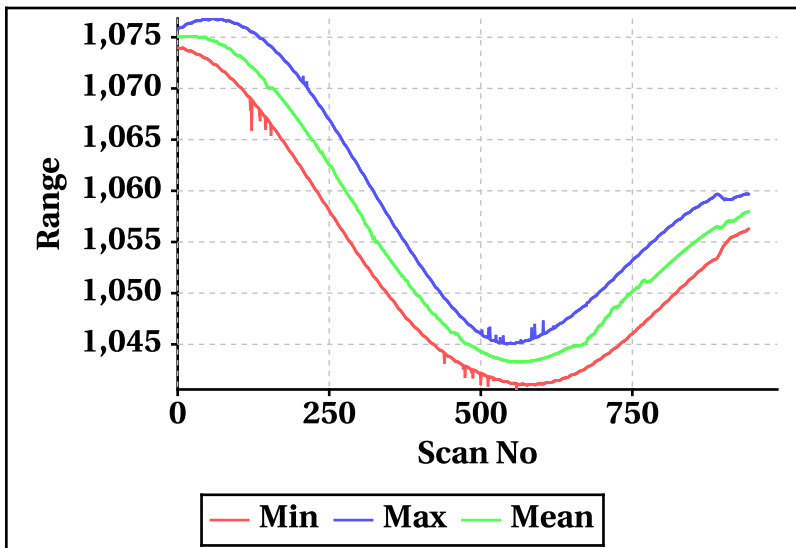
Inner Beam (HH)



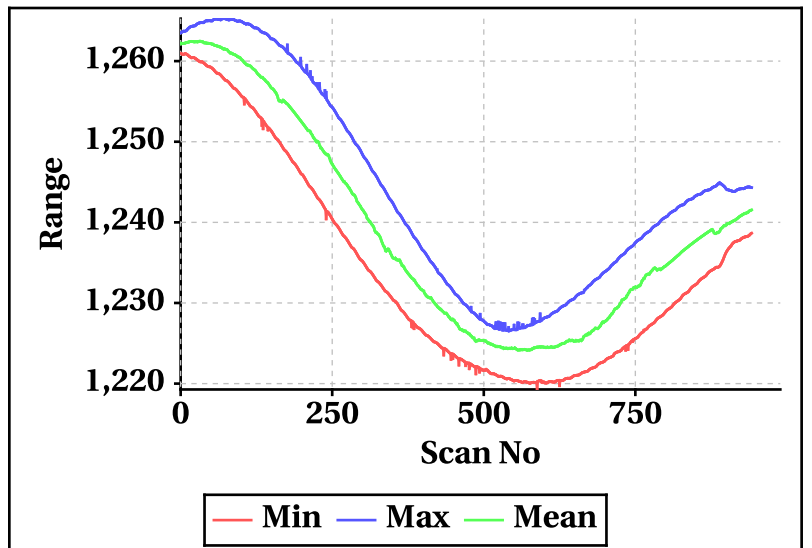
Outer Beam(VV)



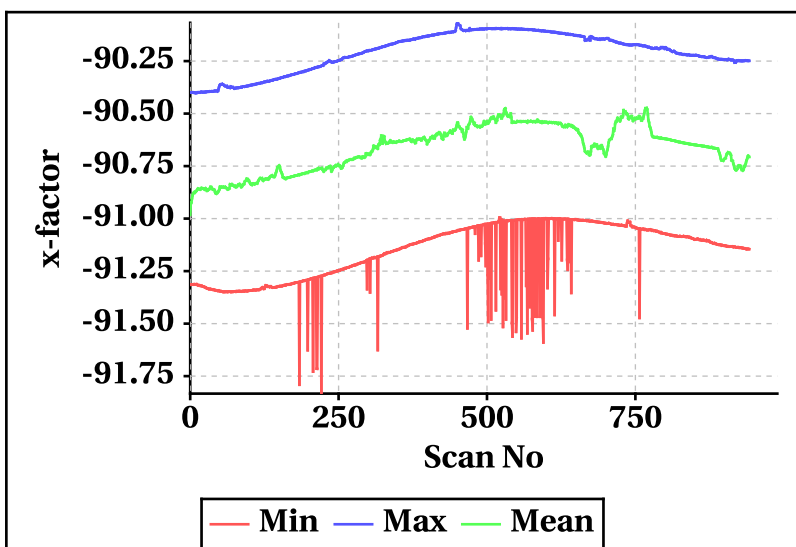
Inner Beam (HH)



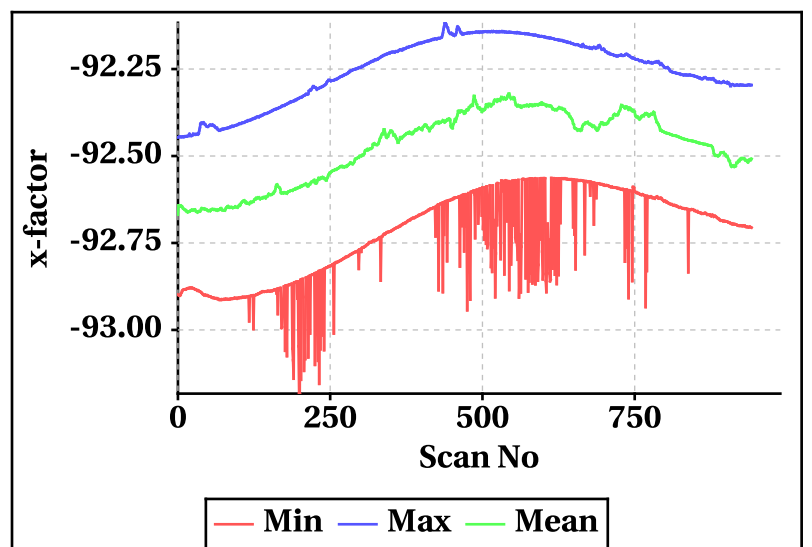
Outer Beam(VV)



Inner Beam (HH)



Outer Beam(VV)



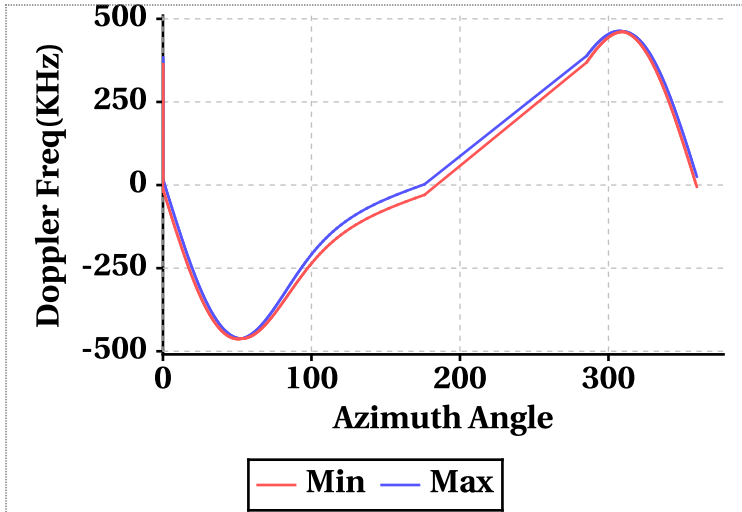


# Doppler Frequency Variation

Doppler Frequency(KHz) variation statistics Over the half Orbit

|     | Inner Beam (HH) | Outer Beam (VV) |
|-----|-----------------|-----------------|
| Min | -463.04         | -518.92         |
| Max | 463.22          | 519.08          |

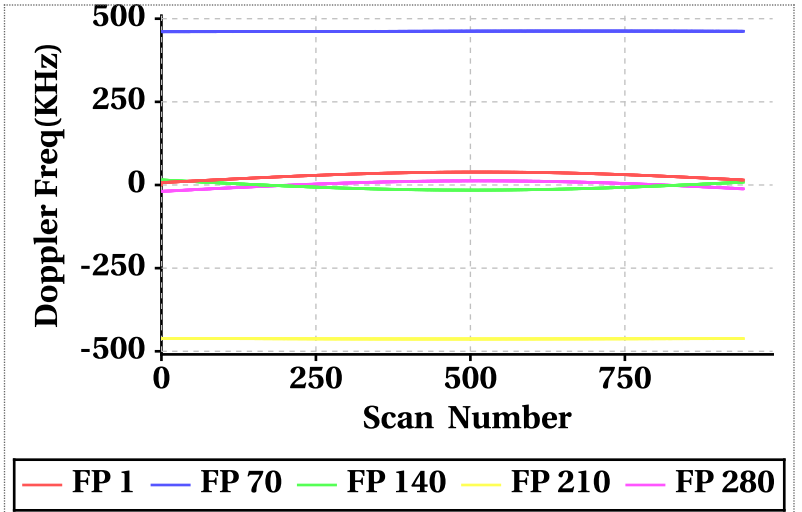
Footprint wise Doppler frequency variation Inner Beam (HH)



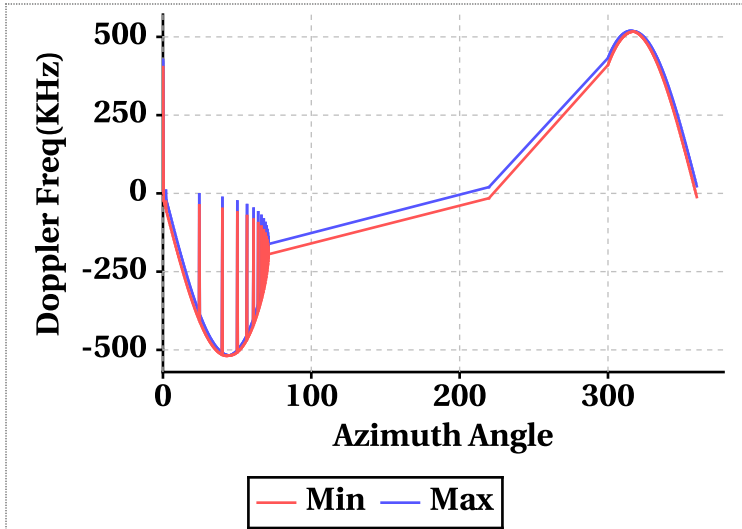
Doppler Frequency(KHz) variation

| Doppler_FP  | Inner Beam (HH) |         |         | Outer Beam (VV) |         |         |
|-------------|-----------------|---------|---------|-----------------|---------|---------|
|             | Min             | Max     | Mean    | Min             | Max     | Mean    |
| Doppler_1   | 0.00            | 38.92   | 28.74   | -11.44          | 37.96   | 26.58   |
| Doppler_70  | 460.80          | 462.82  | 462.07  | 516.42          | 518.82  | 517.99  |
| Doppler_140 | -15.46          | 15.22   | -5.49   | -23.20          | 11.32   | -11.99  |
| Doppler_210 | -462.98         | -461.42 | -462.43 | -518.72         | -517.24 | -518.22 |
| Doppler_280 | -19.10          | 12.64   | 2.34    | -15.42          | 20.02   | 8.51    |

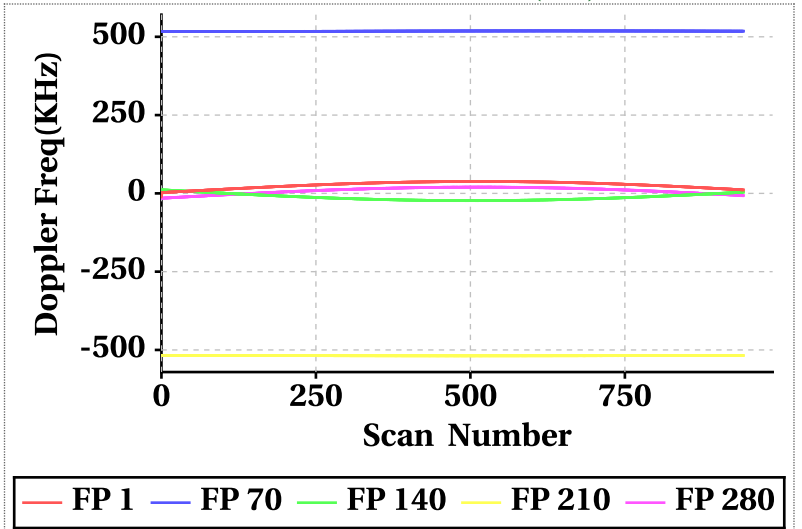
Doppler frequency variation at footprints: 1, 70, 140, 210 & 280 Inner Beam (HH)



Footprint wise Doppler frequency variation Outer Beam (VV)

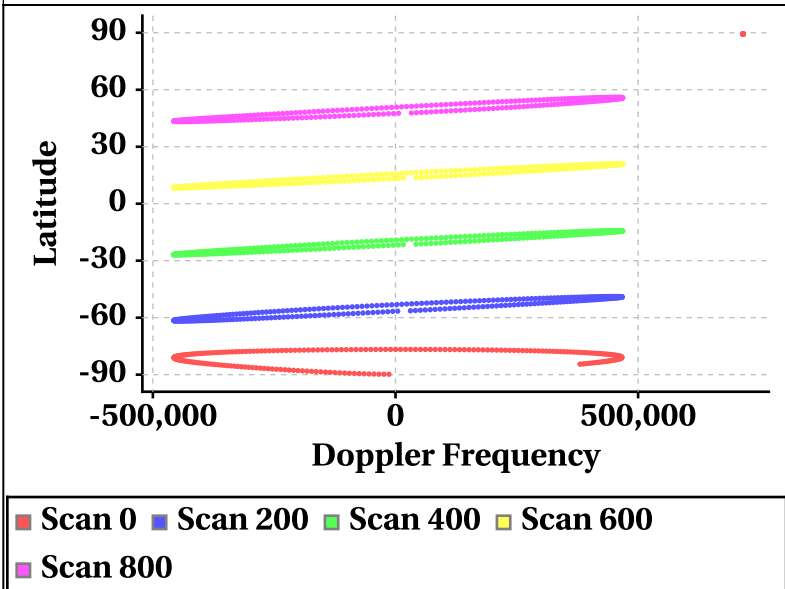


Doppler frequency variation at footprints: 1, 70, 140, 210 & 280 Outer Beam (VV)

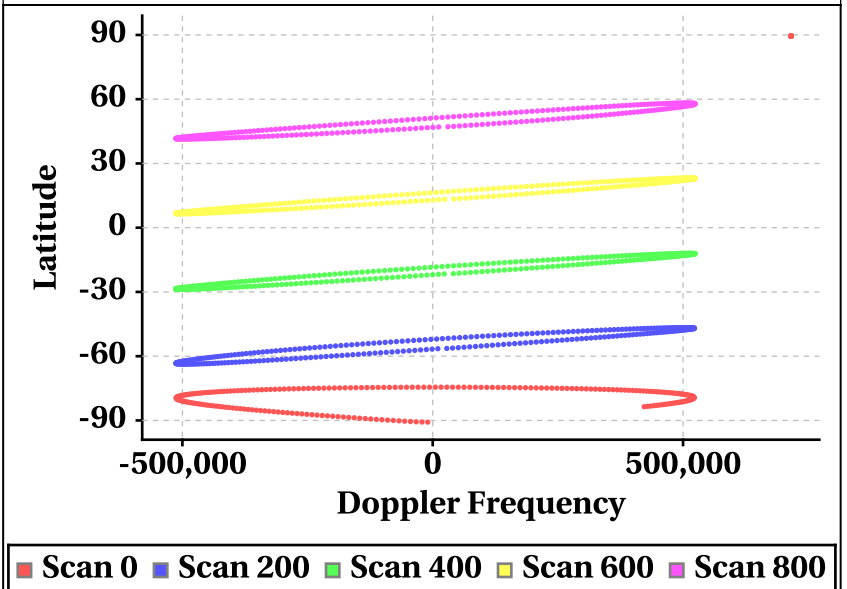


# Latitude Vs Doppler Frequency

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



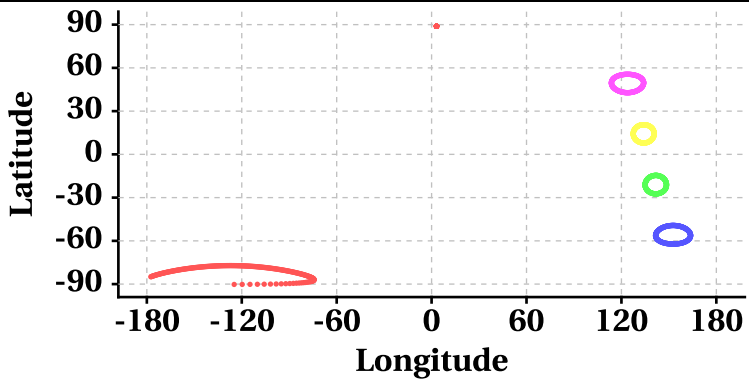
Doppler Frequency at Scan Interval of 200 [Outer Beam(VV)]



# Parameter as a function of Latitude

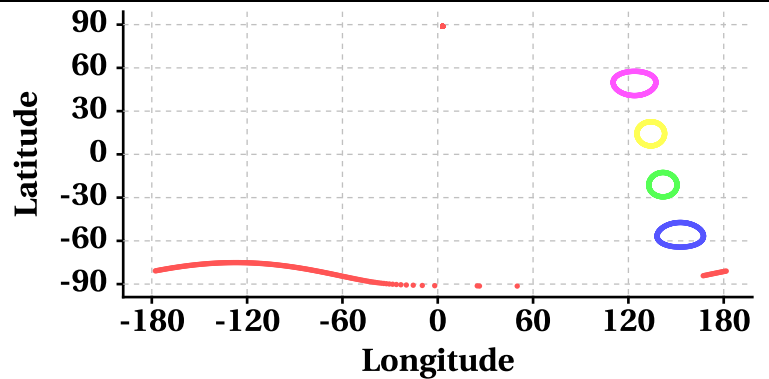
## Latitude Vs Longitude

Scan Trace [Inner Beam(HH)]



Scan 0 Scan 200 Scan 400 Scan 600  
Scan 800

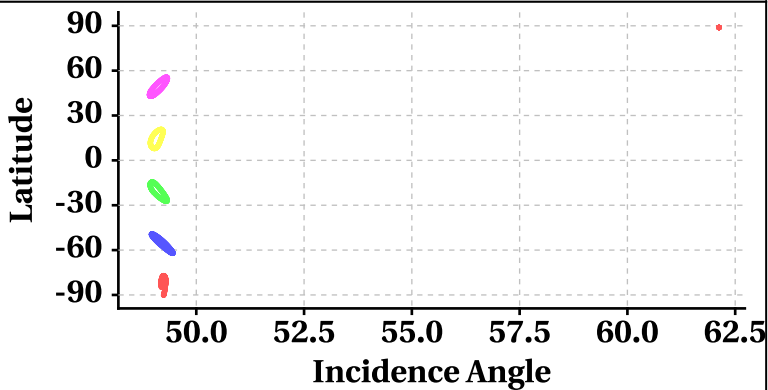
Scan Trace [Outer Beam (VV)]



Scan 0 Scan 200 Scan 400 Scan 600  
Scan 800

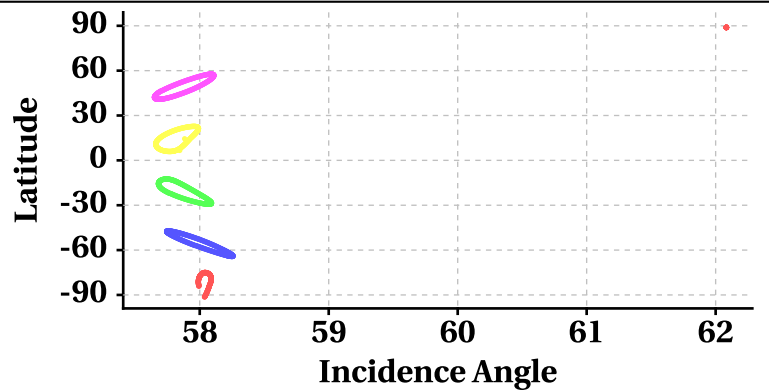
## Latitude Vs Incidence Angle

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



Scan 0 Scan 200 Scan 400 Scan 600  
Scan 800

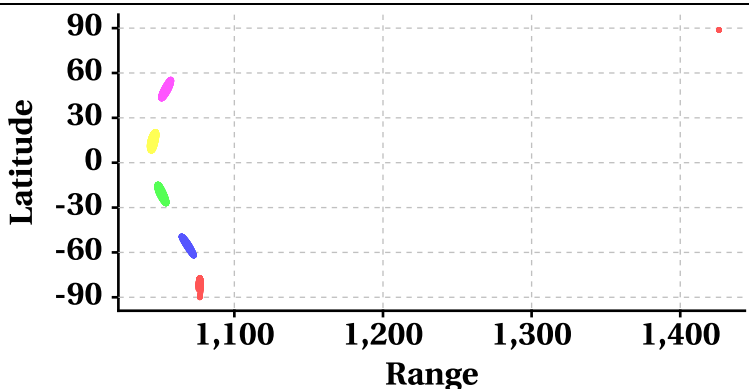
Incidence Angle at Scan Interval of 200 [Outer Beam (VV)]



Scan 0 Scan 200 Scan 400 Scan 600  
Scan 800

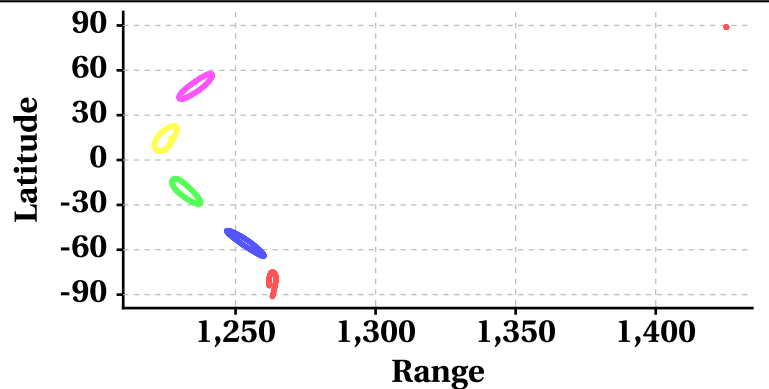
## Latitude Vs Range

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

