

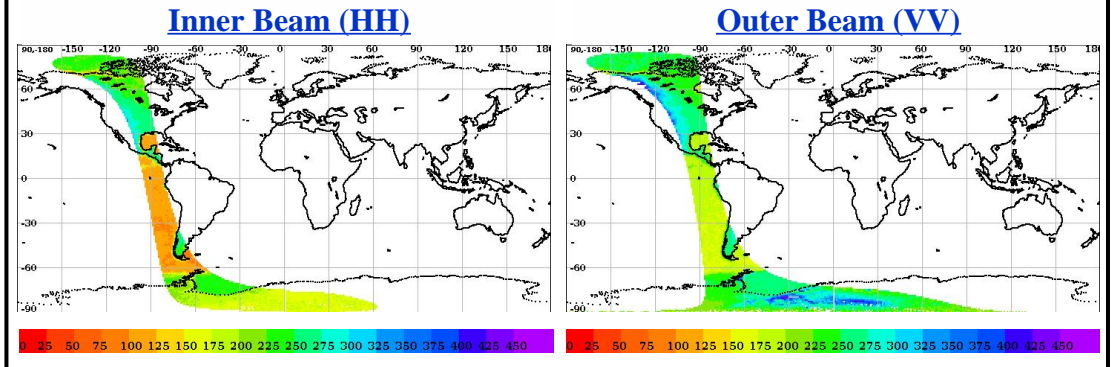
# SCATSAT-1 Scatterometer Level-1B Data Quality Evaluation Report

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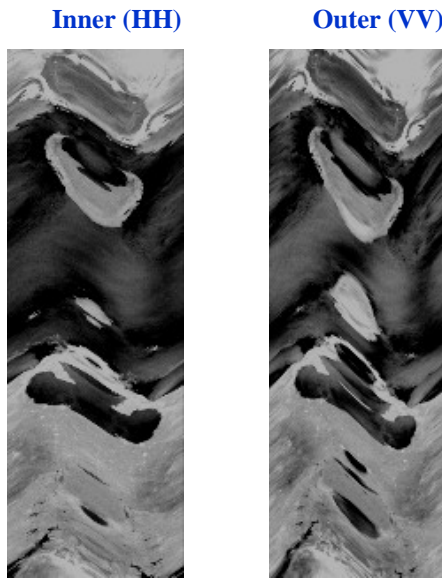
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|                              |               |                              |              |                               |     |
|------------------------------|---------------|------------------------------|--------------|-------------------------------|-----|
| <b>Satellite Id</b>          | ScatSat-1     | <b>Start Orbit</b>           | 5725         | <b>Total Scans</b>            | 954 |
| <b>Sensor Name</b>           | Scatterometer | <b>End Orbit</b>             | 5726         | <b>No of Inner FootPrints</b> | 281 |
| <b>Processor Version</b>     | v1.1.2        | <b>Rev. Number</b>           | 05725_05726  | <b>No Of Outer FootPrints</b> | 282 |
| <b>Half Orbit Direction</b>  | SN            | <b>Data Production Date</b>  | 26-10-2017   | <b>No. Of Inner Slices</b>    | 9   |
| <b>Equator Crossing Date</b> | 26-10-2017    | <b>Equator Crossing Time</b> | 02:34:25.000 | <b>No Of Outer Slices</b>     | 14  |

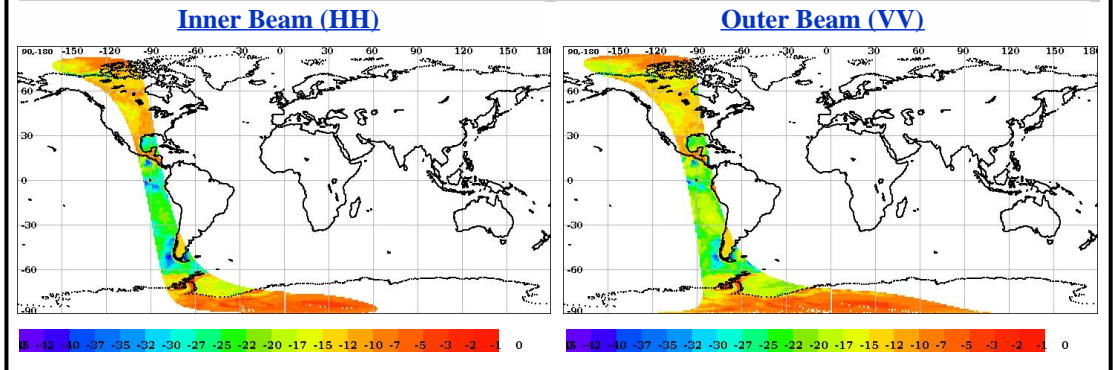
## Brightness Temperature(k) Footprint trace



## Image Snapshot for Inner & Outer Beam



## Sigma0(dB) Footprint trace



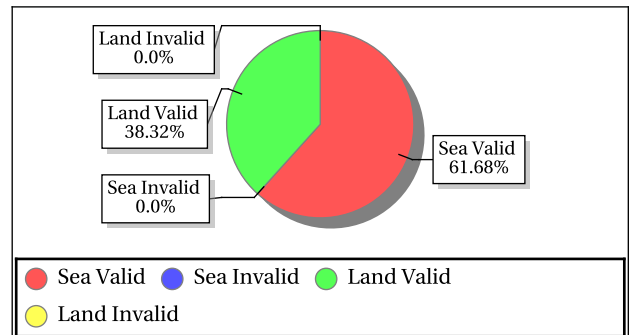
## Invalid and Poor Sigma-0 Quality Flag Statistics for Inner/Outer Slices\*

| <b>Sigma-0 Flags</b>                            | <b>Inner Beam</b> | <b>Outer Beam</b> |
|---|-------------------|-------------------|
| <b>Invalid Sigma0(%)</b>                        | 0.00              | 0.57              |
| <b>Data Not Available From Payload (%)</b>      | 0.0               | 0.0               |
| <b>Slice not within sample array limits (%)</b> | 0.00              | 100.00            |
| <b>C(S+N) - C(N) &lt; 0.1 (%)</b>               | 0.00              | 0.00              |
| <b>Poor Sigma0(%)</b>                           | 0.00              | 0.01              |
| <b>Noise samples for blending Saturated</b>     | 0.0               | 0.0               |
| <b>Count samp. for interpol. saturated (%)</b>  | 0.00              | 0.00              |
| <b>Sigma0 &lt; lower bound (-96dB) (%)</b>      | 0.0               | 0.0               |
| <b>Sigma0 &gt; upper bound (0 dB) (%)</b>       | 0.00              | 0.00              |
| <b>SNR &lt; -65 dB (%)</b>                      | 100.0             | 100.0             |

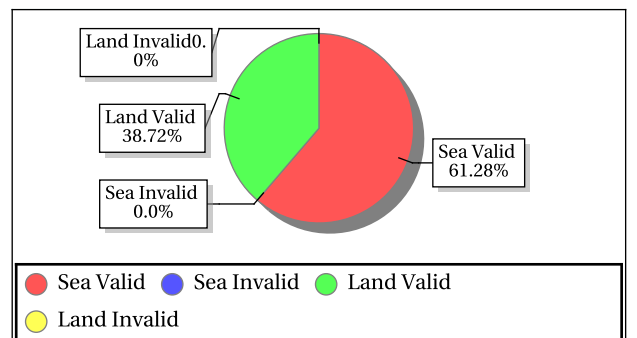
\*DP Format Document

## 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>       | 0.10    | 232.77 | 0.22 | 1.172        | 0.10     | 241.07 | 0.18 | 0.789        | 0.10     | 0.28  | 0.10  | 0.000        | 0.10      | 0.27  | 0.10  | 0.000        |
| <b>Kpa</b>      | 0.01    | 0.01   | 0.01 | 0.000        | 0.01     | 0.01   | 0.01 | 0.000        | 0.01     | 0.01  | 0.01  | 0.000        | 0.01      | 0.01  | 0.01  | 0.000        |
| <b>Kpb</b>      | 0.01    | 0.02   | 0.01 | 0.000        | 0.01     | 0.02   | 0.01 | 0.000        | 0.01     | 0.01  | 0.01  | 0.000        | 0.01      | 0.01  | 0.01  | 0.000        |
| <b>Kpc</b>      | 0.01    | 0.01   | 0.01 | 0.000        | 0.01     | 0.01   | 0.01 | 0.000        | 0.01     | 0.01  | 0.01  | 0.000        | 0.01      | 0.01  | 0.01  | 0.000        |
| <b>SNR</b>      | -34.40  | 22.84  | 4.72 | 0.003        | -34.55   | 26.31  | 6.16 | 0.984        | -3.48    | 30.27 | 17.40 | 6.976        | -3.30     | 29.38 | 18.08 | 7.224        |

| Outer Beam (VV) |         |        |      |              |          |        |      |              |          |       |       |              |           |       |       |              |
|-----------------|---------|--------|------|--------------|----------|--------|------|--------------|----------|-------|-------|--------------|-----------|-------|-------|--------------|
|                 | Sea Aft |        |      |              | Sea Fore |        |      |              | Land Aft |       |       |              | Land fore |       |       |              |
|                 | Min     | Max    | Mean | Bad Occ. (%) | Min      | Max    | Mean | Bad Occ. (%) | Min      | Max   | Mean  | Bad Occ. (%) | Min       | Max   | Mean  | Bad Occ. (%) |
| <b>Kp</b>       | 0.08    | 179.95 | 0.19 | 1.227        | 0.08     | 163.10 | 0.18 | 0.965        | 0.08     | 13.02 | 0.09  | 0.127        | 0.08      | 65.09 | 0.10  | 0.204        |
| <b>Kpa</b>      | 0.01    | 0.01   | 0.01 | 0.000        | 0.01     | 0.01   | 0.01 | 0.000        | 0.01     | 0.01  | 0.01  | 0.000        | 0.01      | 0.01  | 0.01  | 0.000        |
| <b>Kpb</b>      | 0.01    | 0.01   | 0.01 | 0.000        | 0.01     | 0.01   | 0.01 | 0.000        | 0.01     | 0.01  | 0.01  | 0.000        | 0.01      | 0.01  | 0.01  | 0.000        |
| <b>Kpc</b>      | 0.00    | 0.01   | 0.00 | 0.000        | 0.00     | 0.01   | 0.00 | 0.000        | 0.00     | 0.01  | 0.00  | 0.000        | 0.00      | 0.01  | 0.00  | 0.000        |
| <b>SNR</b>      | -34.16  | 16.47  | 2.92 | 0.000        | -33.74   | 19.63  | 4.16 | 0.000        | -22.74   | 21.43 | 12.04 | 0.000        | -29.75    | 22.97 | 12.10 | 0.075        |

| 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           | 49.50   | 49.10   | 0.000        | 57.51           | 58.41   | 58.06   | 0.000        | Inci.(Inner)             | 47.10   | 49.90   |
| <b>Azimuth Diff. (deg)</b>   | 0.0026          | 6.76    | 1.27    | 1.717        | 0.0000          | 293.11  | 1.27    | 3.151        | Inci.(Outer)             | 57.30   | 58.90   |
| <b>Range(Km)</b>             | 1026.92         | 1100.54 | 1055.05 | 10.109       | 1203.52         | 1295.21 | 1239.92 | 34.117       | Azimuth Diff.            | 0.60    | 2.00    |
| <b>X Factor(dbm)</b>         | -92.16          | -89.33  | -90.51  | 0.000        | -93.63          | -91.81  | -92.46  | 0.000        | Range(Inner)             | 1025.00 | 1095.70 |
| <b>Across Distance (Km)</b>  | 15.17           | 15.84   | 15.43   | 0.000        | 20.07           | 20.72   | 20.31   | 0.000        | Range(Outer)             | 1210.00 | 1280.00 |
| <b>Along Distance (Km)</b>   | 18.80           | 20.50   | 19.73   | 0.000        | 18.38           | 20.52   | 19.63   | 0.000        | 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   |
|                              |                 |         |         |              |                 |         |         |              |                          |         |         |

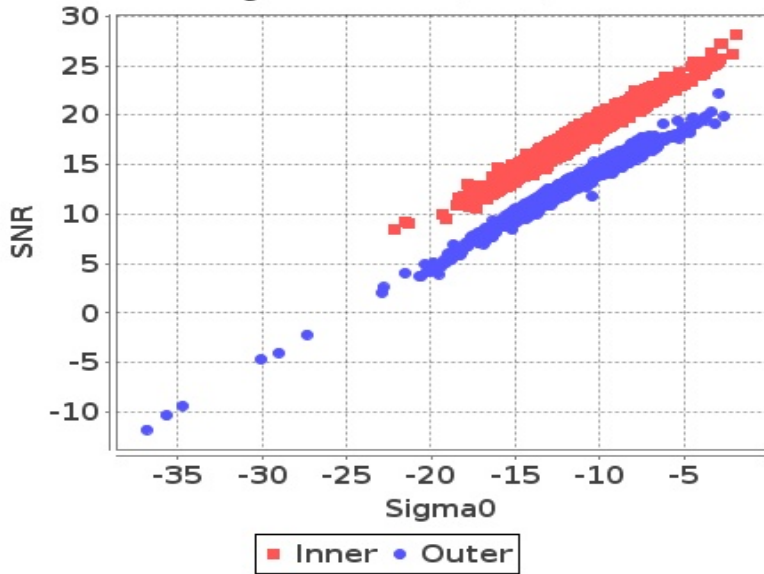
- Normal
- Deviations
- Alarming
- High Errors



# Sigma0 Behaviour (Sigma0 Vs SNR)

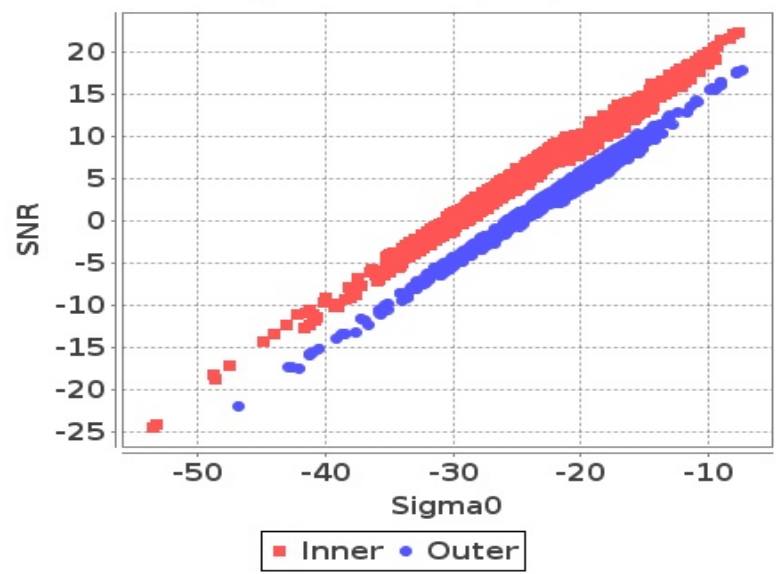
### Footprint-Land

#### Sigma0 Vs SNR (Land)



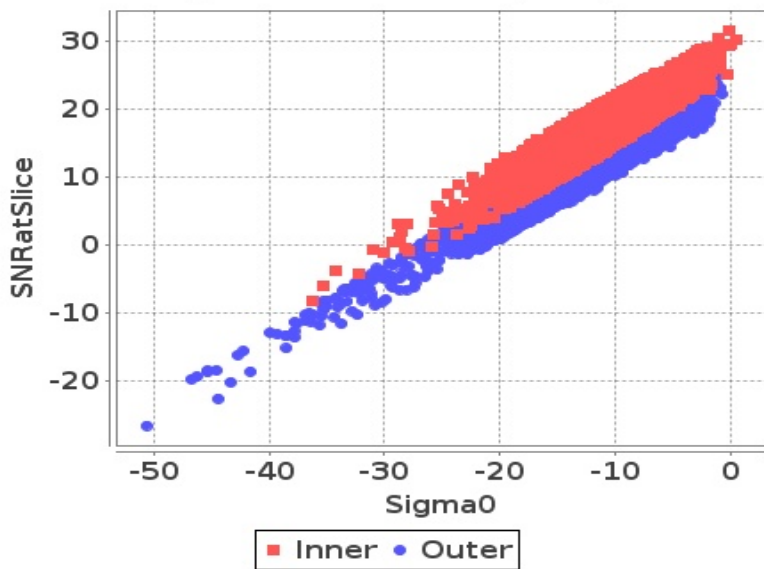
### Footprint-Sea

#### Sigma0 Vs SNR (Sea)



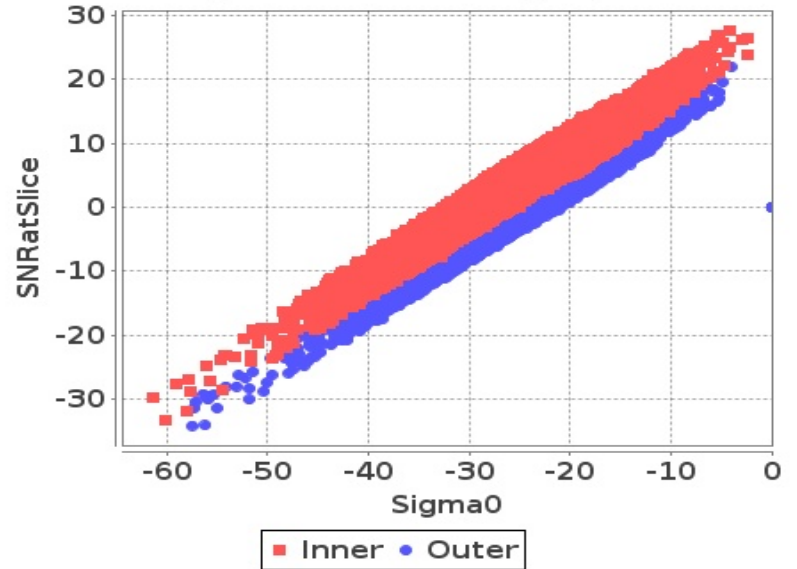
### Slice-Land

#### Sigma0 Vs SNRatSlice (Land)



### Slice-Sea

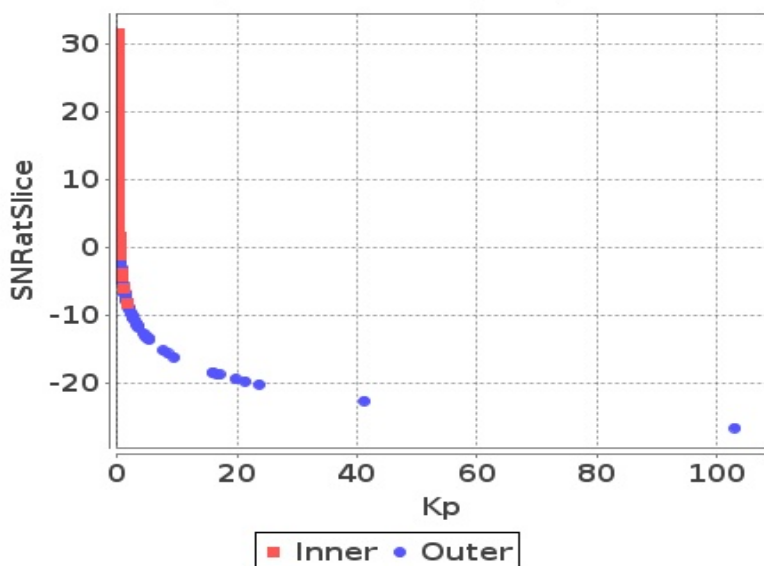
#### Sigma0 Vs SNRatSlice (Sea)



# Sigma0 Behaviour (Kp Vs SNR)

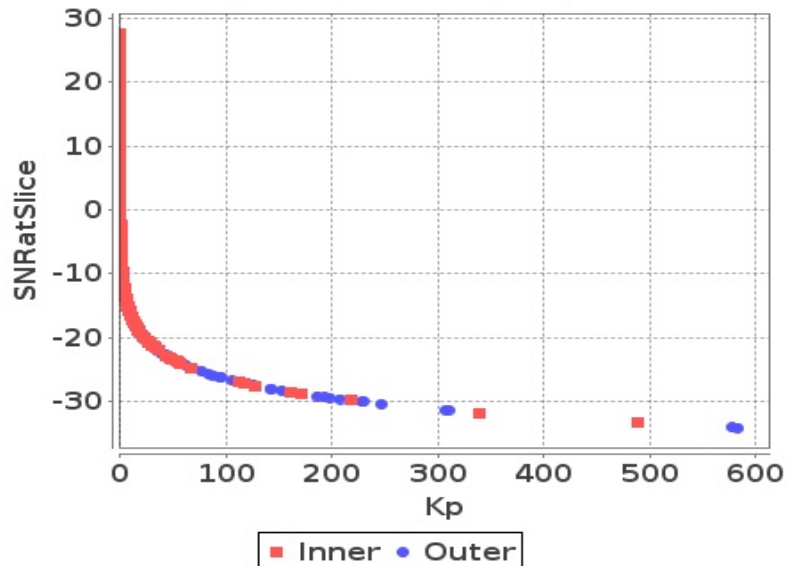
### Slice

#### Kp Vs SNRatSlice (Land)



### Slice

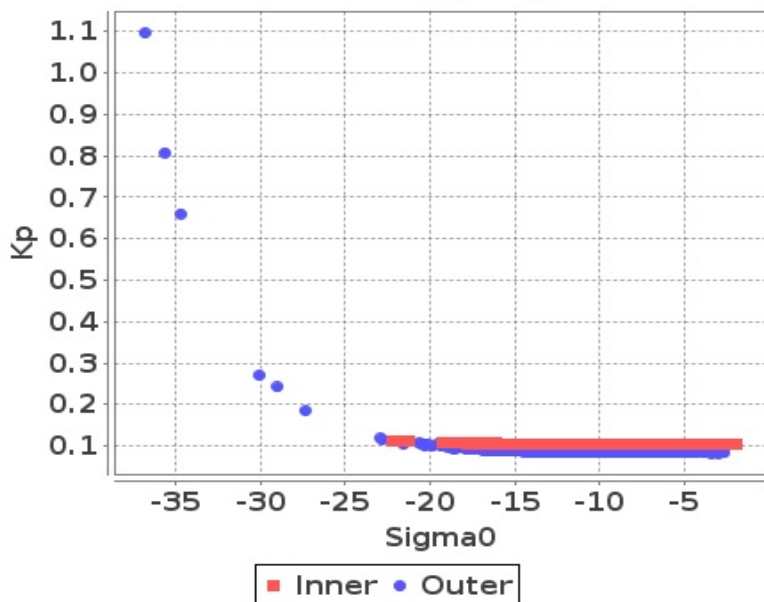
#### Kp Vs SNRatSlice (Sea)



# Sigma0 Behaviour(Sigma0 Vs Kp)

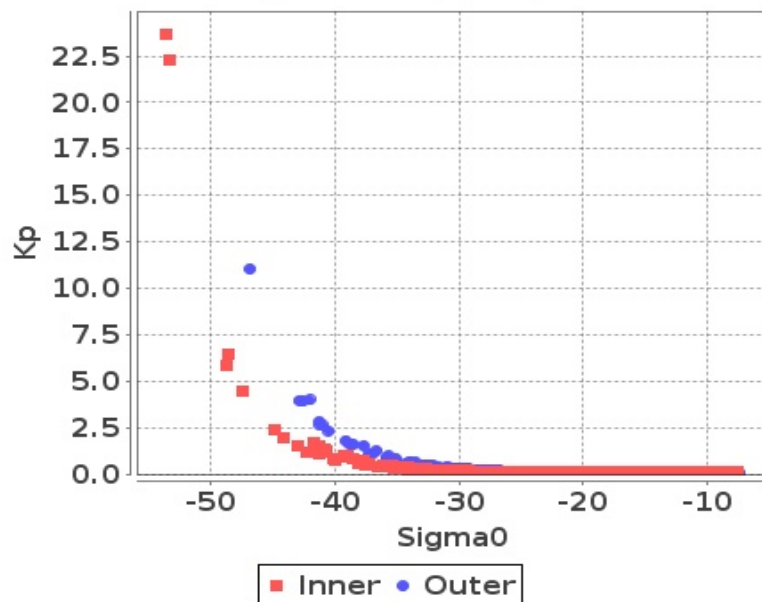
## Footprint-Land

### Sigma0 Vs Kp (Land)



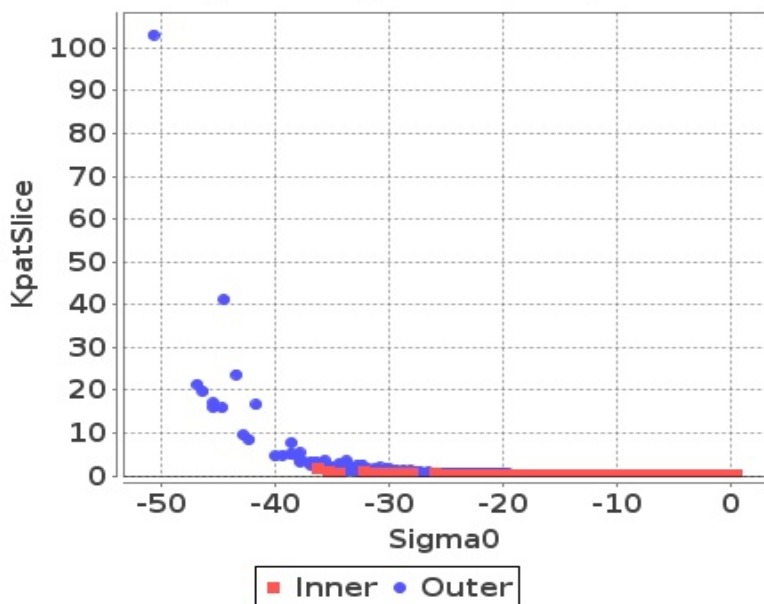
## Footprint-Sea

### Sigma0 Vs Kp (Sea)



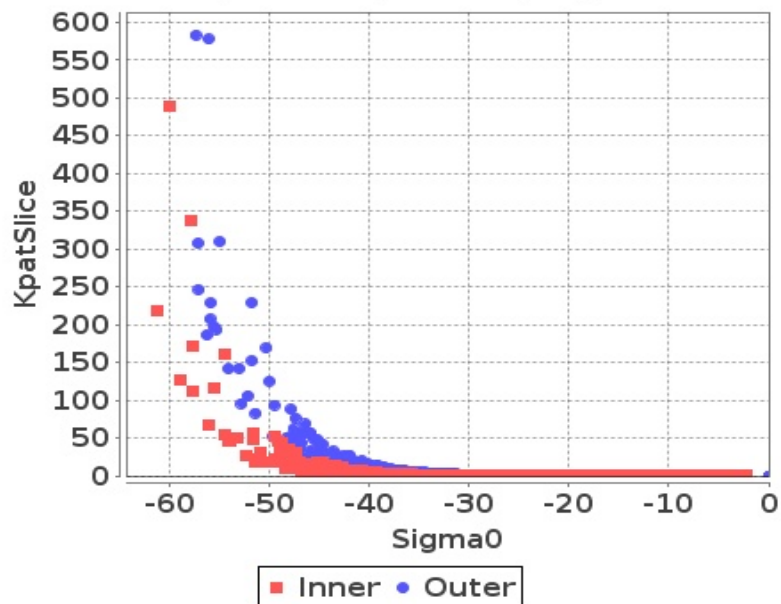
## Slice-Land

### Sigma0 Vs KpatSlice (Land)



## Slice-Sea

### Sigma0 Vs KpatSlice (Sea)



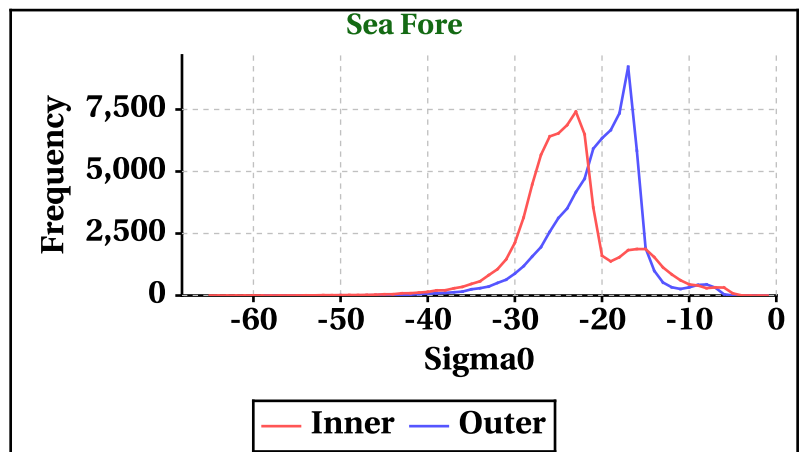
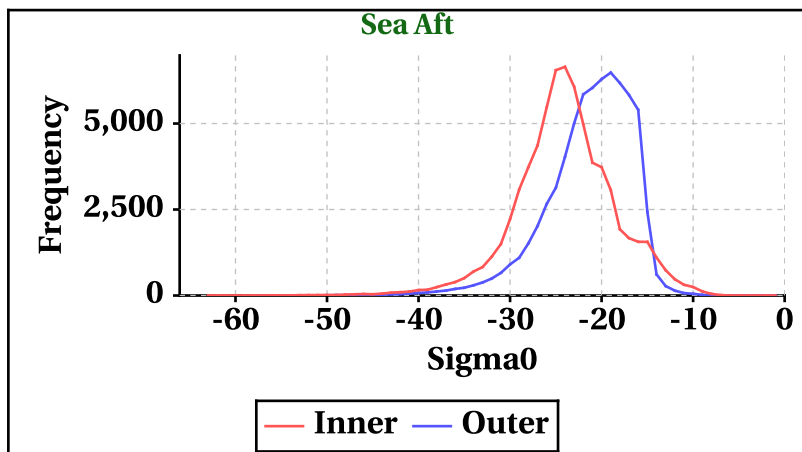
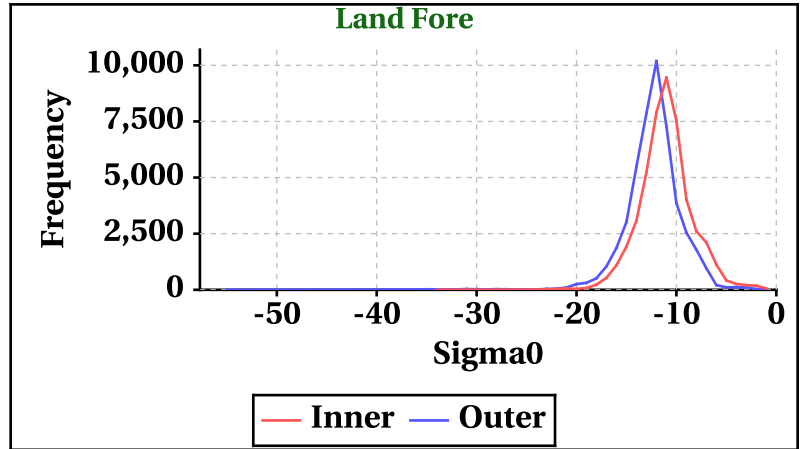
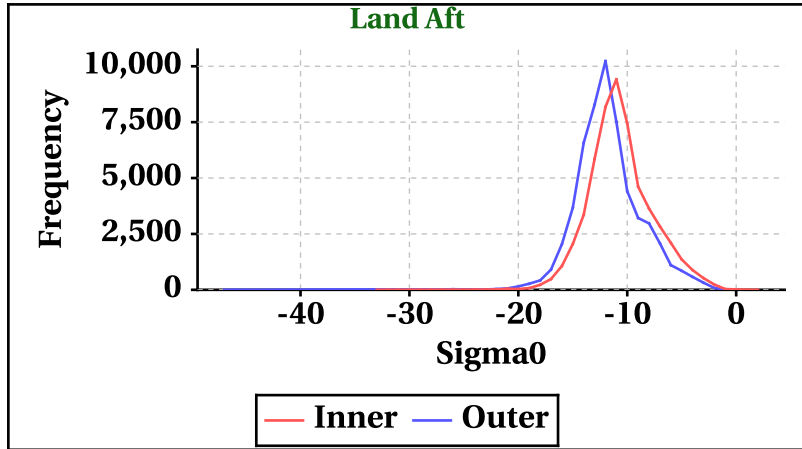


# Dynamic Range (Data Histograms)

## Sigma0(db)

| Inner Beam (HH) |          |           |         |          |
|-----------------|----------|-----------|---------|----------|
|                 | Land Aft | Land Fore | Sea Aft | Sea Fore |
| Min             | -33      | -34       | -63     | -65      |
| Max             | 2        | 0         | 0       | 0        |

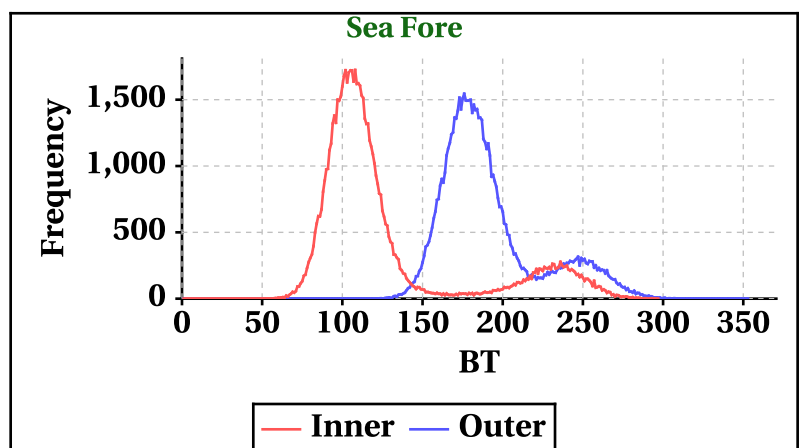
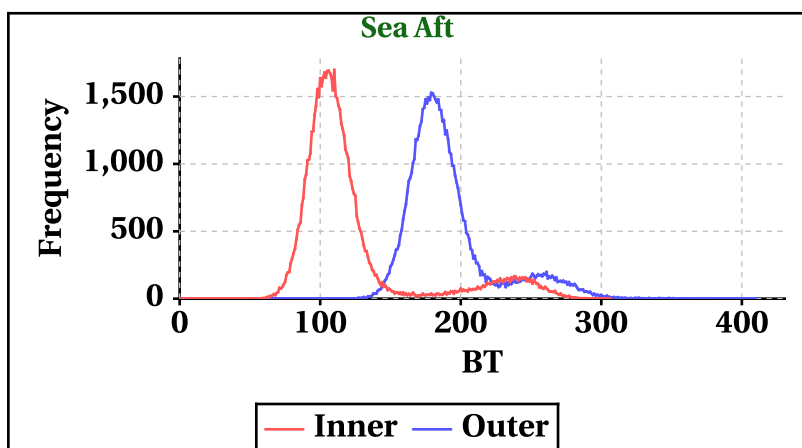
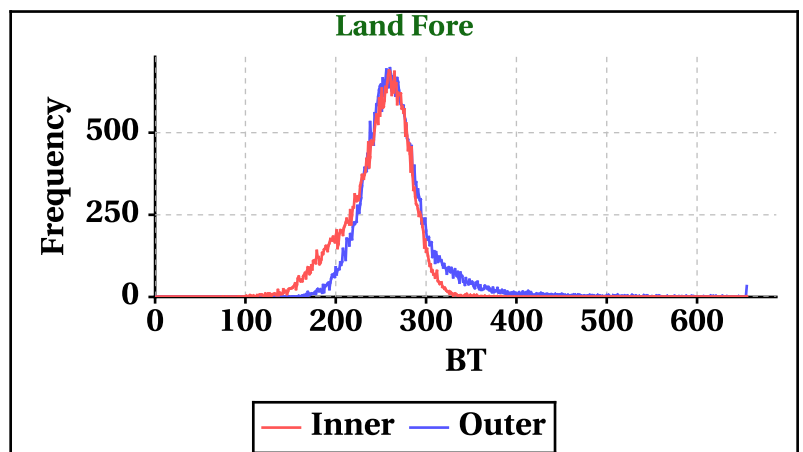
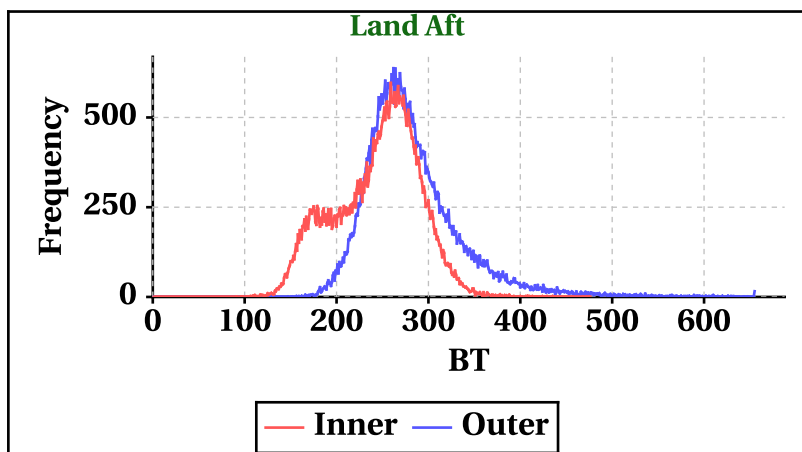
| Outer Beam (VV) |          |           |         |          |
|-----------------|----------|-----------|---------|----------|
|                 | Land Aft | Land Fore | Sea Aft | Sea Fore |
| Min             | -47      | -55       | -58     | -59      |
| Max             | 0        | 0         | 0       | 0        |



## Brightness Temperature(K)

| Inner Beam(HH) |          |           |         |          |
|----------------|----------|-----------|---------|----------|
|                | Land Aft | Land Fore | Sea Aft | Sea Fore |
| Min            | 0        | 0         | 0       | 0        |
| Max            | 476      | 655       | 306     | 297      |

| Outer Beam(VV) |          |           |         |          |
|----------------|----------|-----------|---------|----------|
|                | Land Aft | Land Fore | Sea Aft | Sea Fore |
| Min            | 0        | 0         | 0       | 0        |
| Max            | 655      | 655       | 410     | 353      |

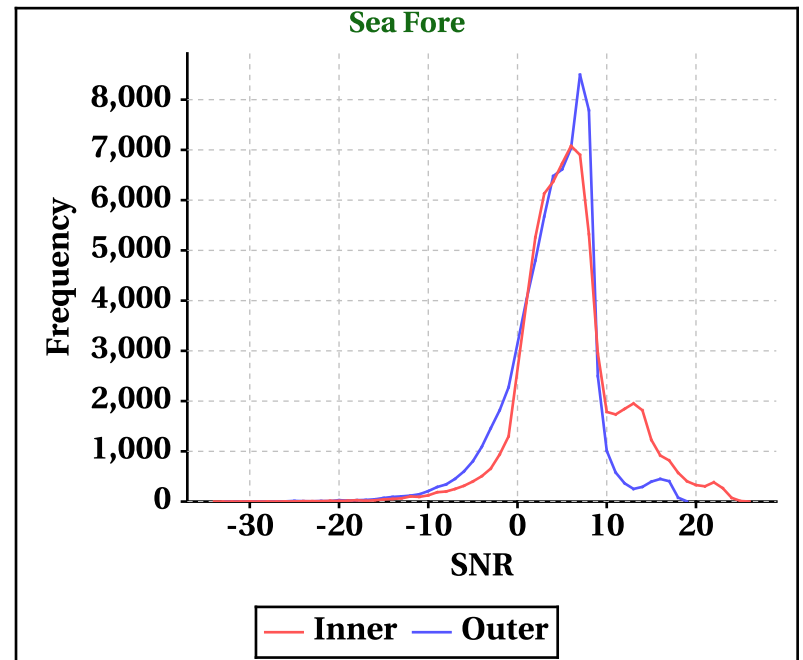
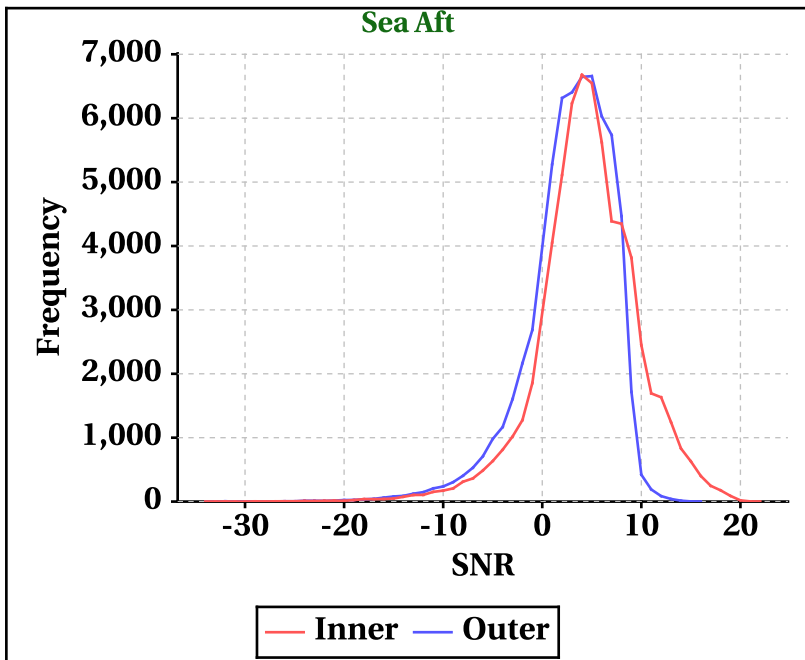
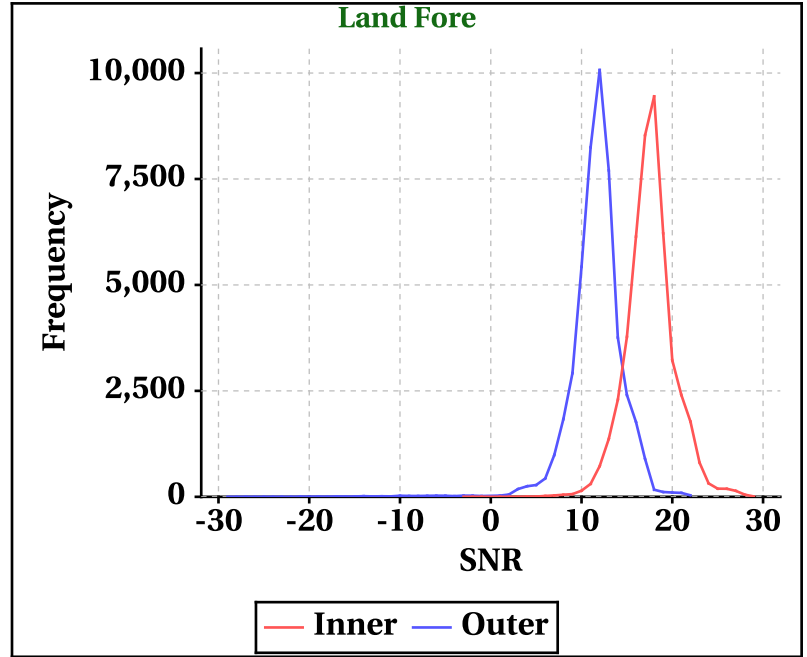
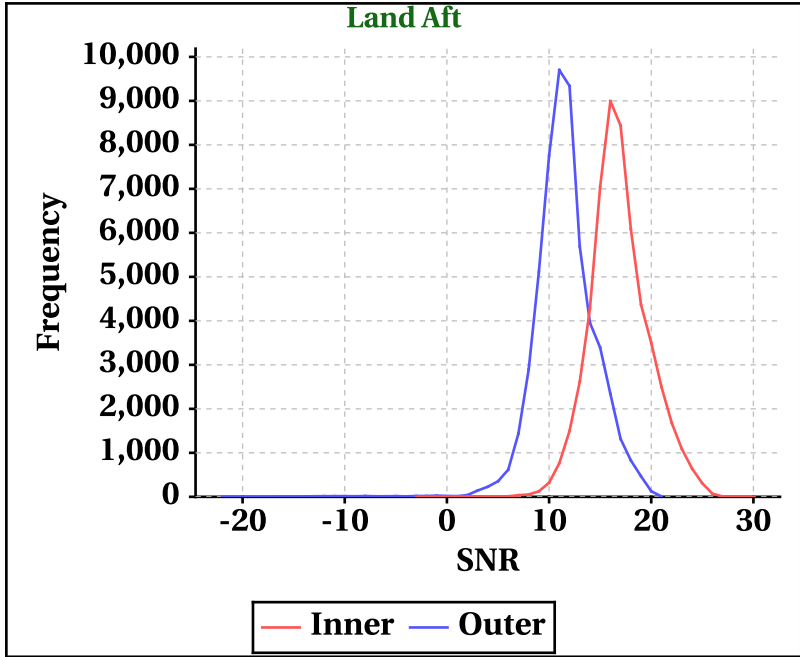


# Dynamic Range (Data Histograms)

## SNR(dBm)

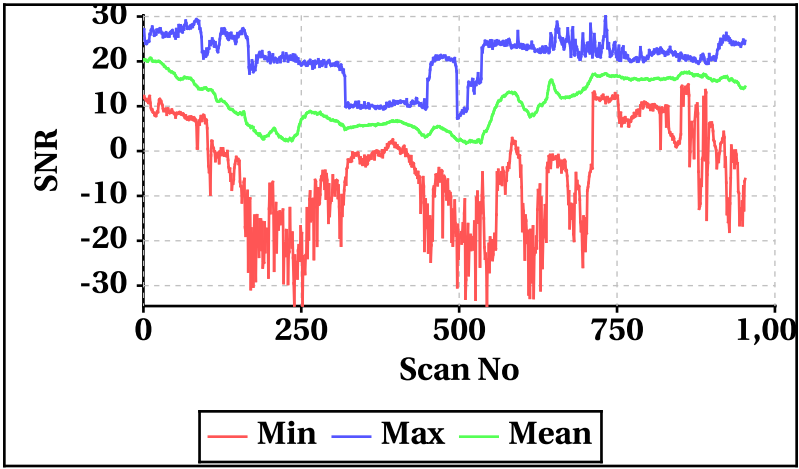
| Inner Beam (HH) |          |           |         |          |
|-----------------|----------|-----------|---------|----------|
|                 | Land Aft | Land Fore | Sea Aft | Sea Fore |
| Min             | -3       | -3        | -34     | -34      |
| Max             | 30       | 29        | 22      | 26       |

| Outer Beam (VV) |          |           |         |          |
|-----------------|----------|-----------|---------|----------|
|                 | Land Aft | Land Fore | Sea Aft | Sea Fore |
| Min             | -22      | -29       | -34     | -33      |
| Max             | 21       | 22        | 16      | 19       |

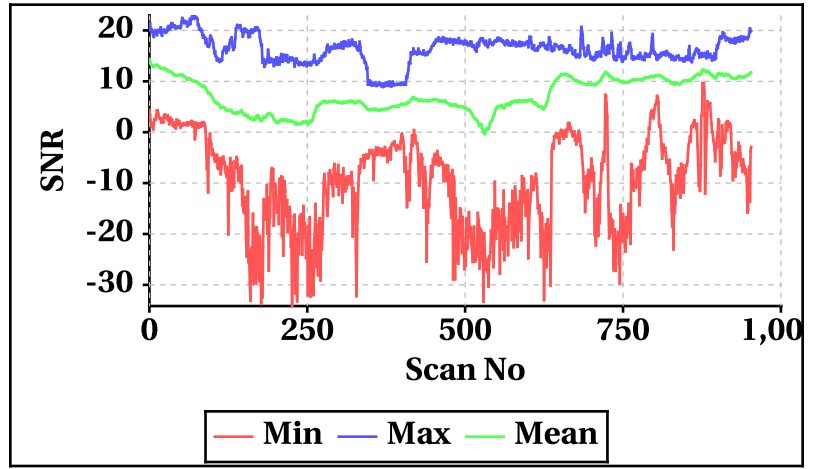


## Orbit-wise behaviour of SNR

Inner Beam (HH)

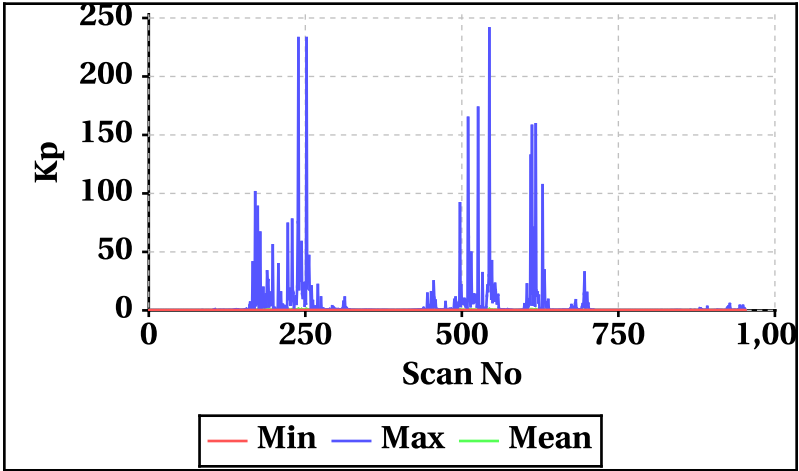


Outer Beam(VV)

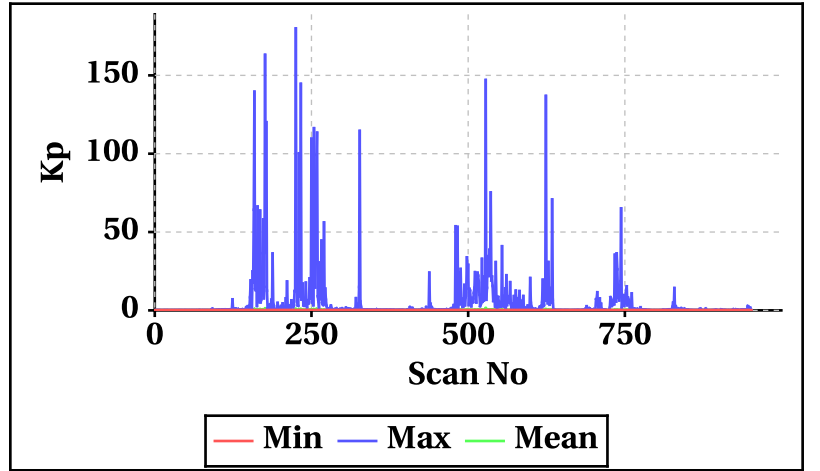


## Orbit-wise behaviour of Kp,Kpa,Kpb,Kpc

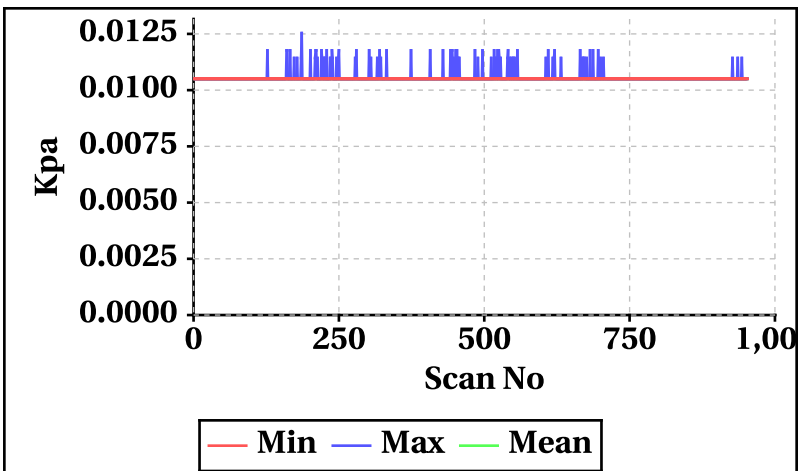
Inner Beam(HH)



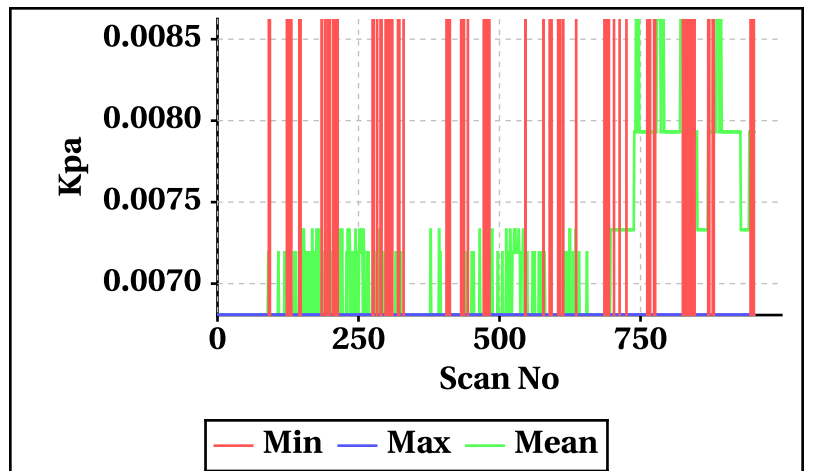
Outer Beam(VV)



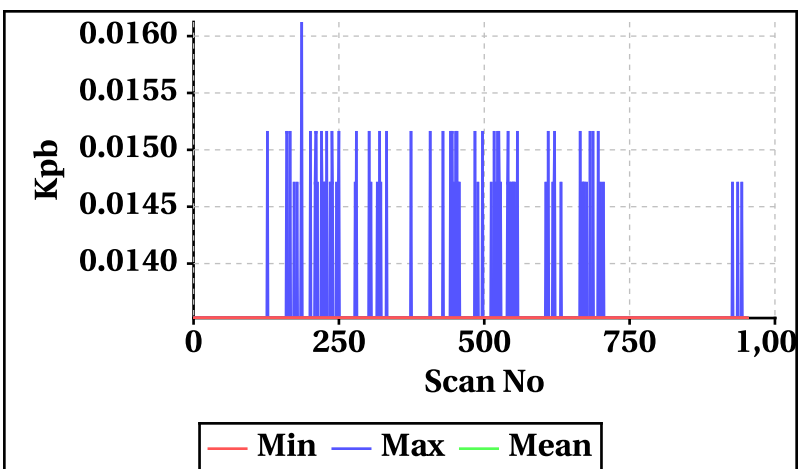
Inner Beam(HH)



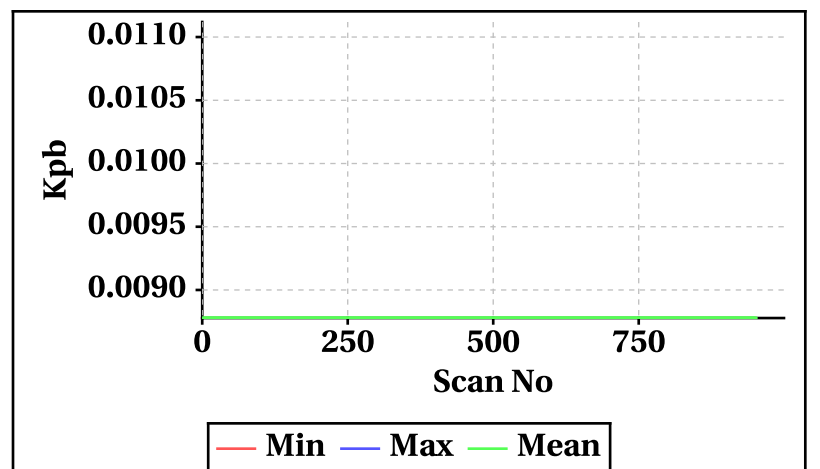
Outer Beam(VV)



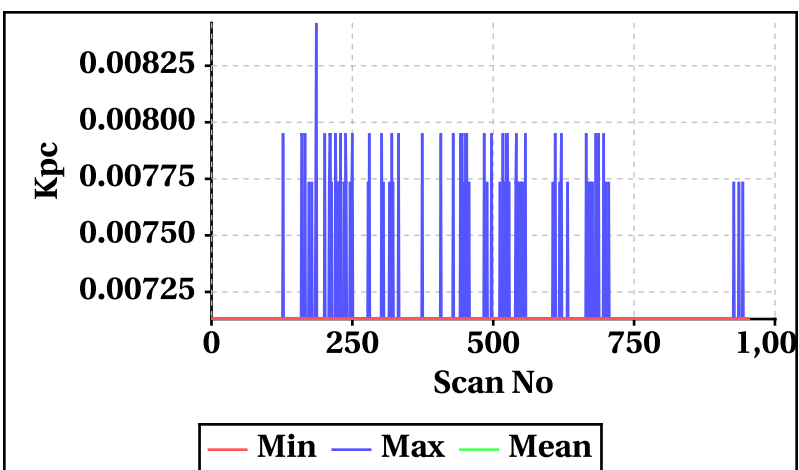
Inner Beam(HH)



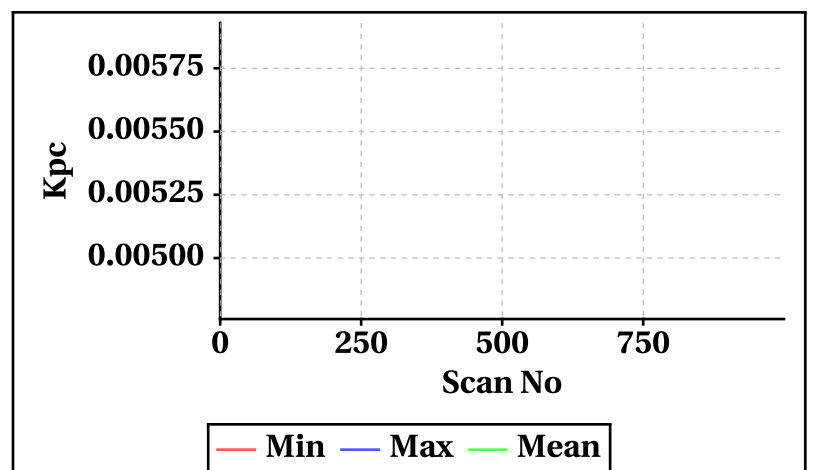
Outer Beam(VV)



Inner Beam(HH)

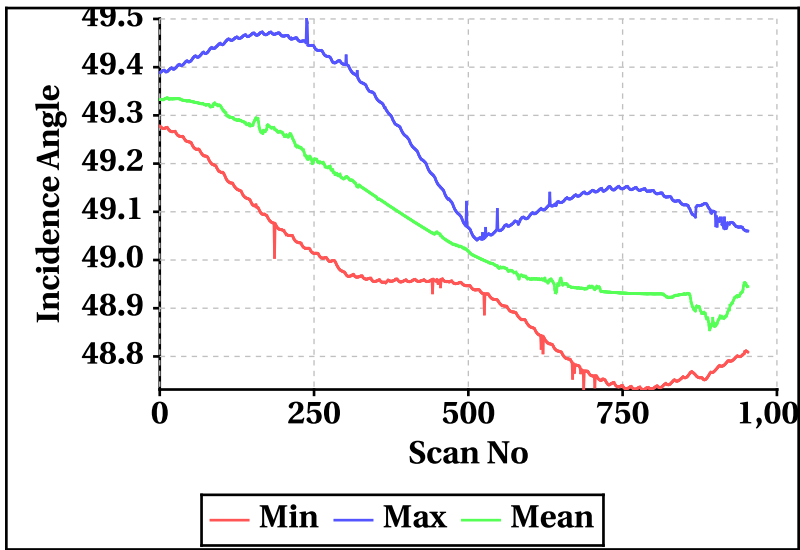


Outer Beam(VV)

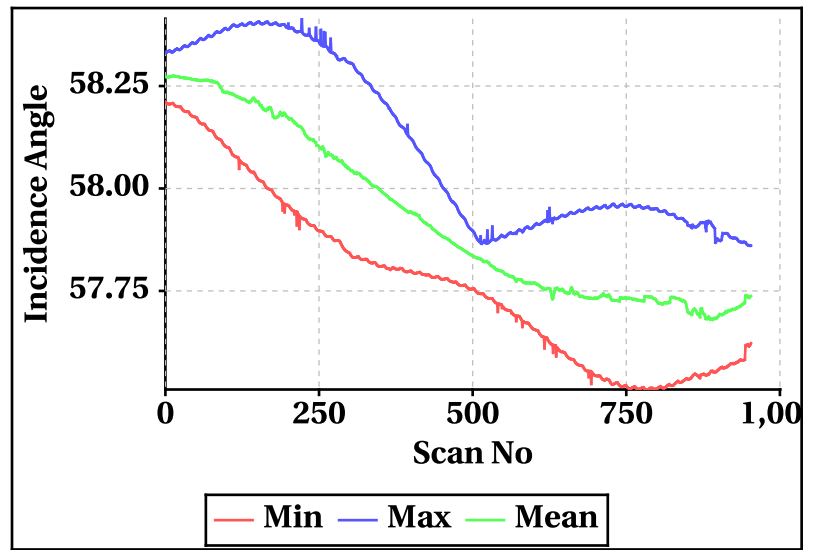


Orbit-wise behaviour of Incidence,Azimuth,Range,X-Factor

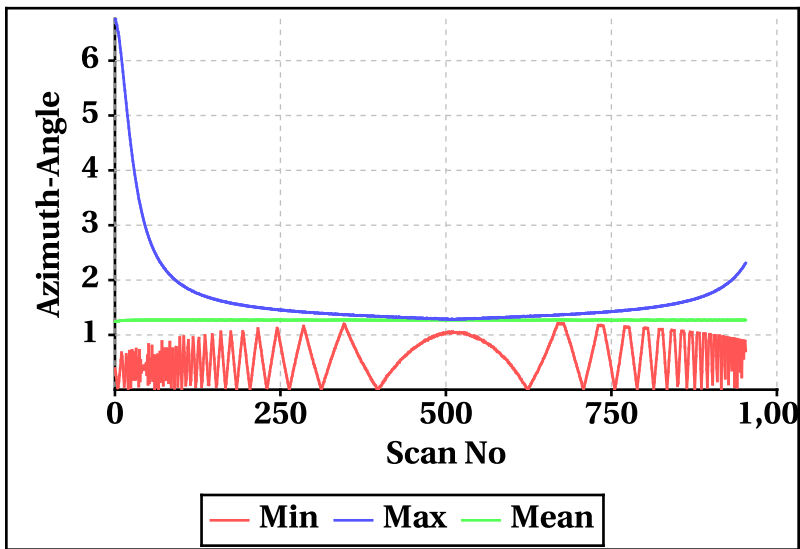
Inner Beam (HH)



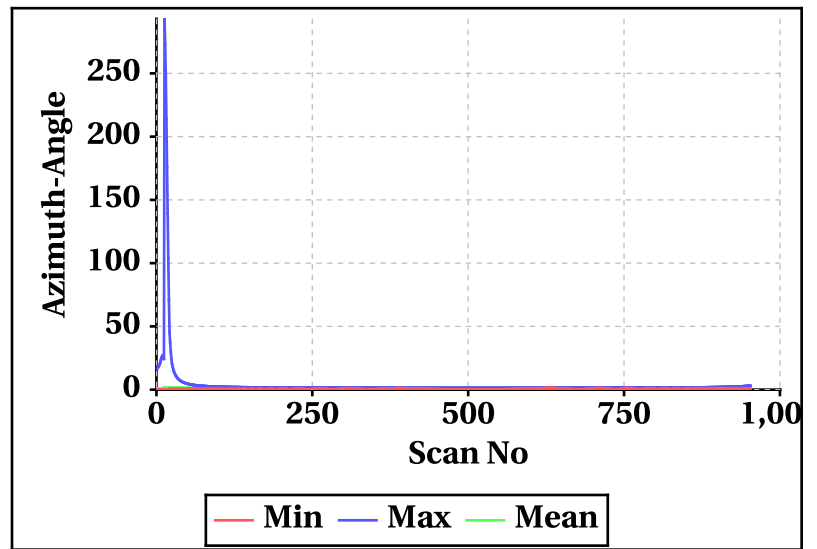
Outer Beam(VV)



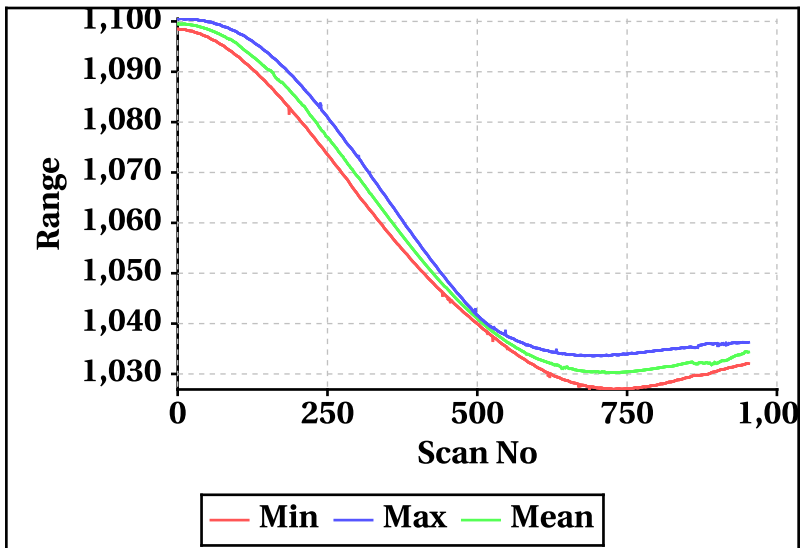
Inner Beam (HH)



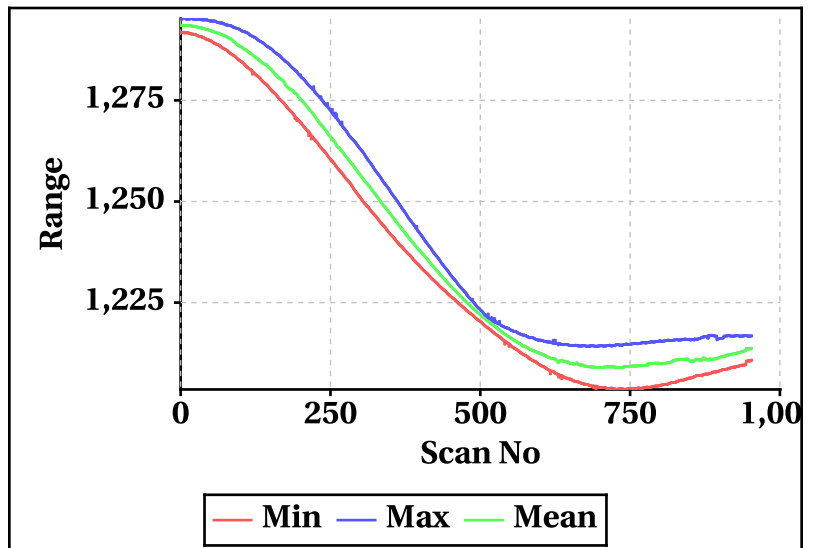
Outer Beam(VV)



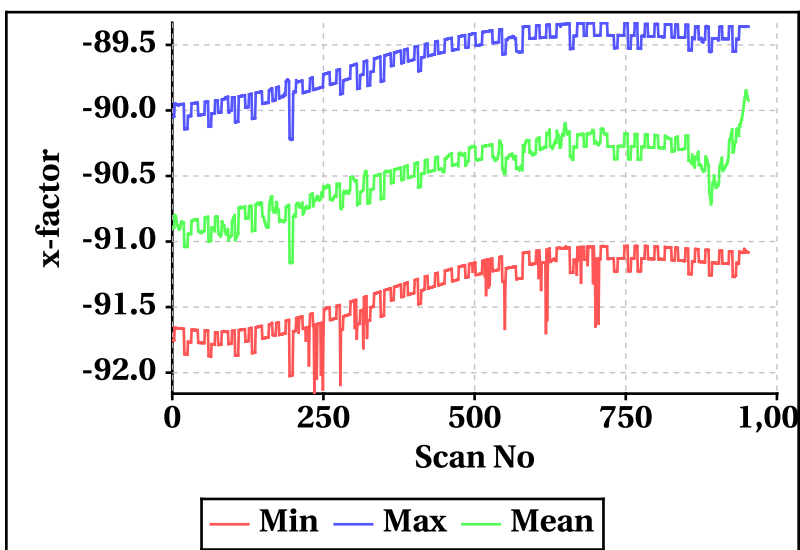
Inner Beam (HH)



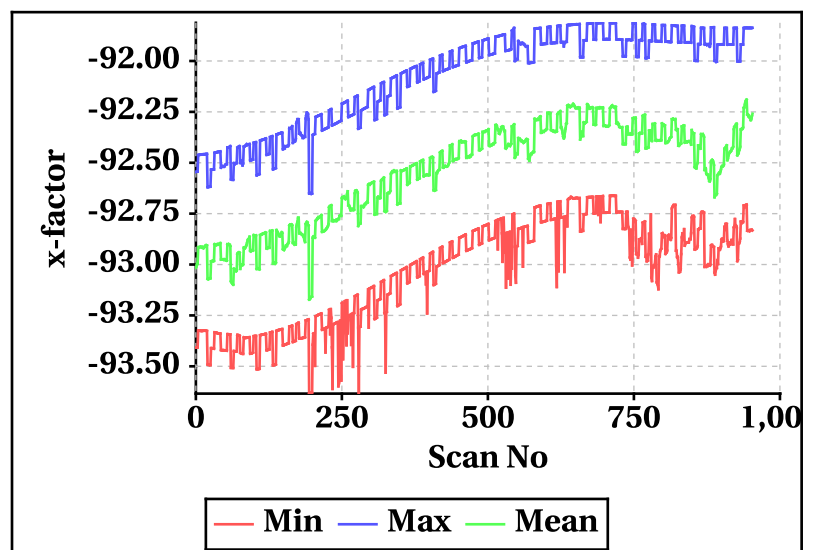
Outer Beam(VV)



Inner Beam (HH)



Outer Beam(VV)



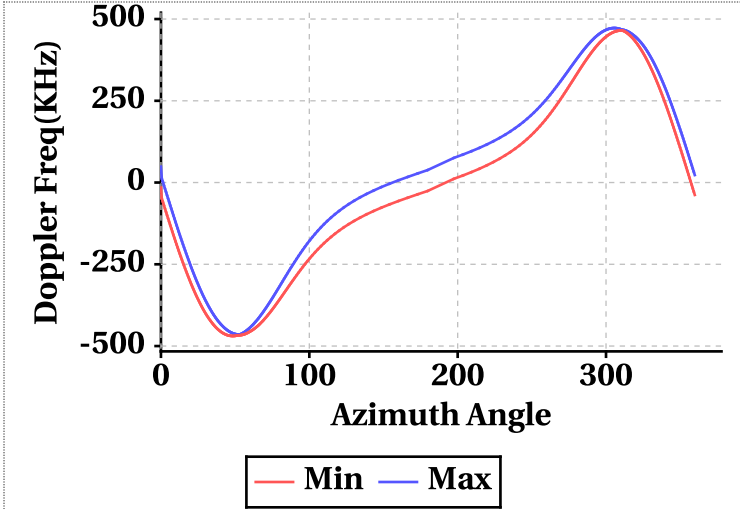


# Doppler Frequency Variation

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

|            | Inner Beam (HH) | Outer Beam (VV) |
|------------|-----------------|-----------------|
| <b>Min</b> | -469.24         | -526.22         |
| <b>Max</b> | 472.40          | 529.04          |

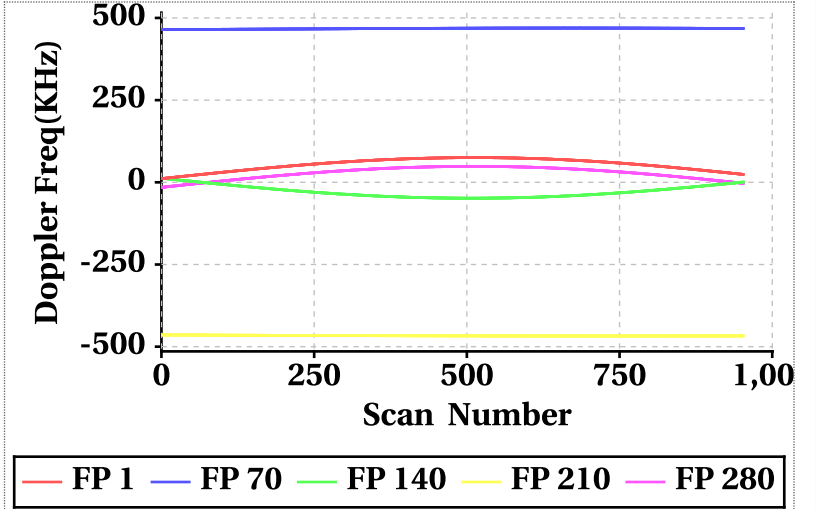
**Footprint wise Doppler frequency variation Inner Beam (HH)**



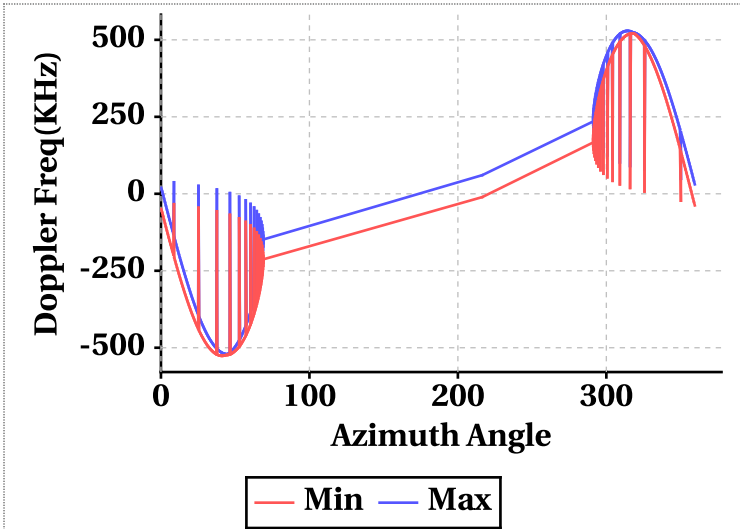
**Doppler Frequency(KHz) variation**

| Doppler_FP  | Inner Beam (HH) |         |         | Outer Beam (VV) |         |         |
|-------------|-----------------|---------|---------|-----------------|---------|---------|
|             | Min             | Max     | Mean    | Min             | Max     | Mean    |
| Doppler_1   | 11.26           | 75.22   | 54.21   | 7.50            | 78.82   | 55.40   |
| Doppler_70  | 464.76          | 469.24  | 467.76  | 520.76          | 526.04  | 524.35  |
| Doppler_140 | -48.46          | 12.54   | -28.45  | -61.14          | 7.56    | -38.62  |
| Doppler_210 | -467.48         | -464.38 | -466.59 | -523.80         | -520.66 | -522.78 |
| Doppler_280 | -15.38          | 48.60   | 27.56   | -10.76          | 60.56   | 37.15   |

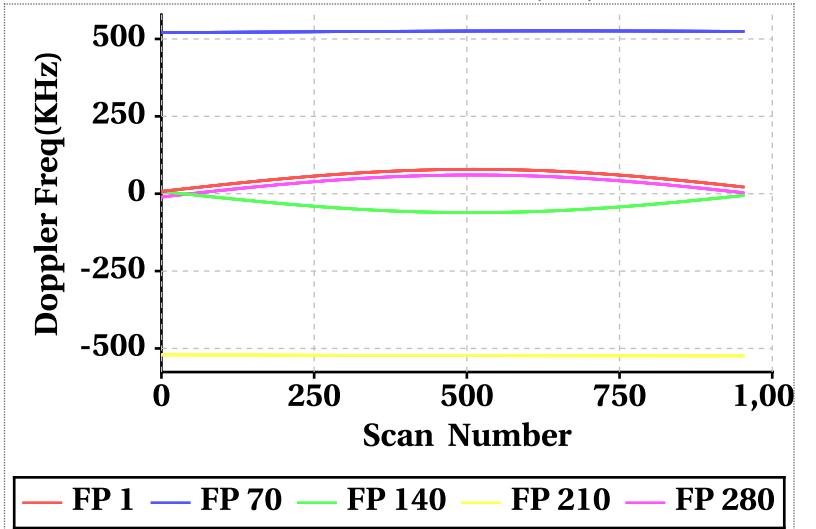
**Doppler frequency variation at footprints: 1, 70, 140, 210 & 280 Inner Beam (HH)**



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

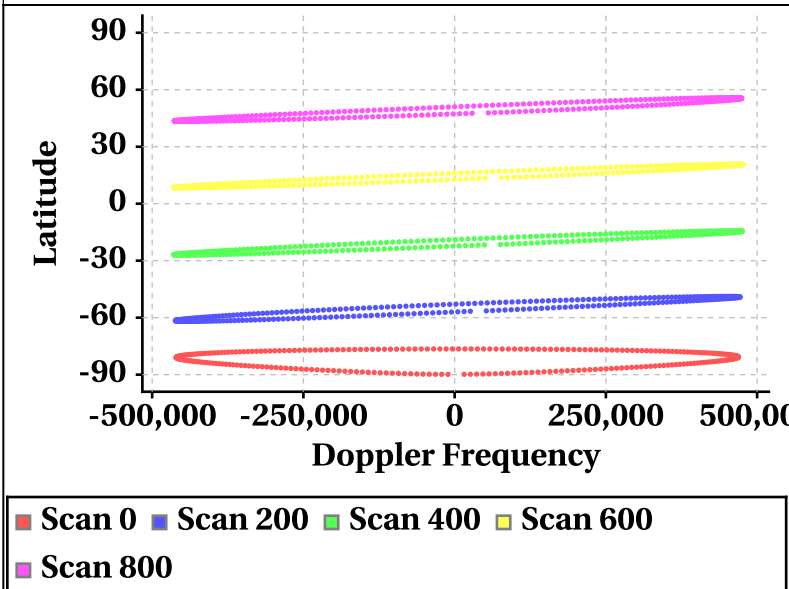


**Doppler frequency variation at footprints: 1, 70, 140, 210 & 280 Outer Beam (VV)**

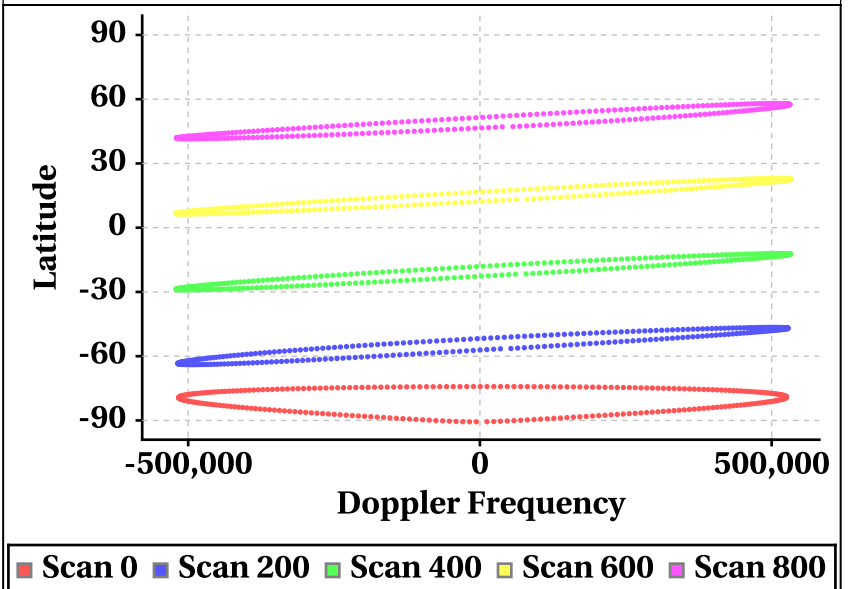


# Latitude Vs Doppler Frequency

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



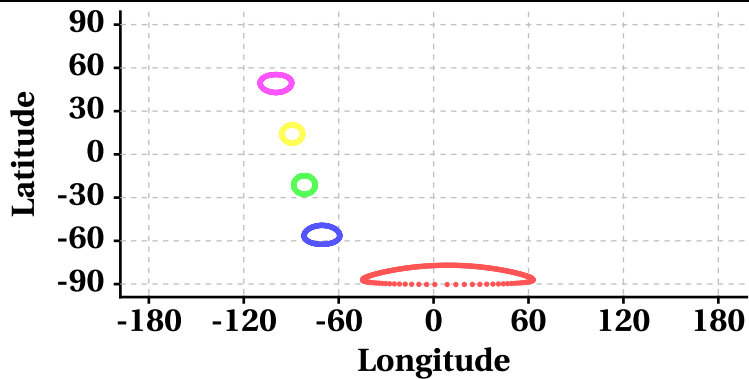
**Doppler Frequency at Scan Interval of 200 [Outer Beam(VV)]**



# Parameter as a function of Latitude

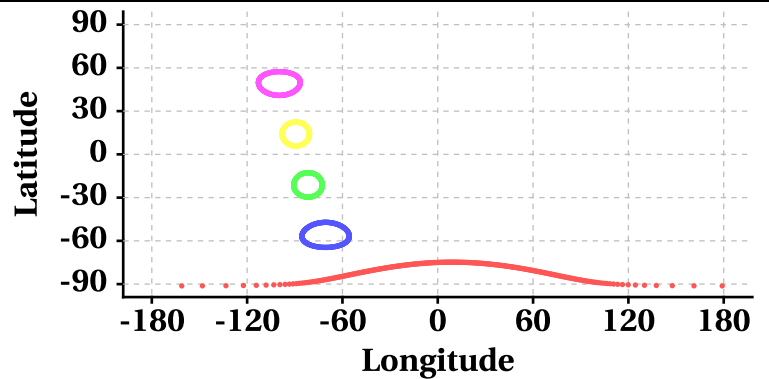
## Latitude Vs Longitude

Scan Trace [Inner Beam(HH)]



Scan 0 Scan 200 Scan 400 Scan 600  
Scan 800

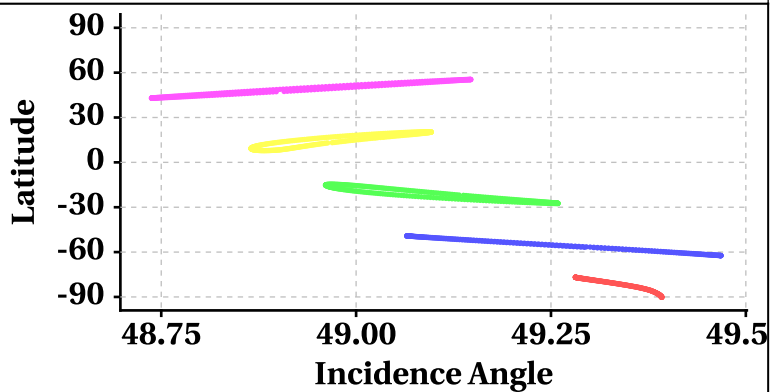
Scan Trace [Outer Beam (VV)]



Scan 0 Scan 200 Scan 400 Scan 600  
Scan 800

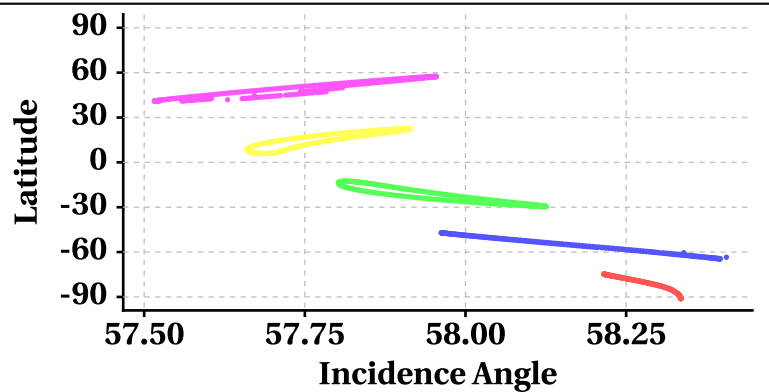
## Latitude Vs Incidence Angle

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



Scan 0 Scan 200 Scan 400 Scan 600  
Scan 800

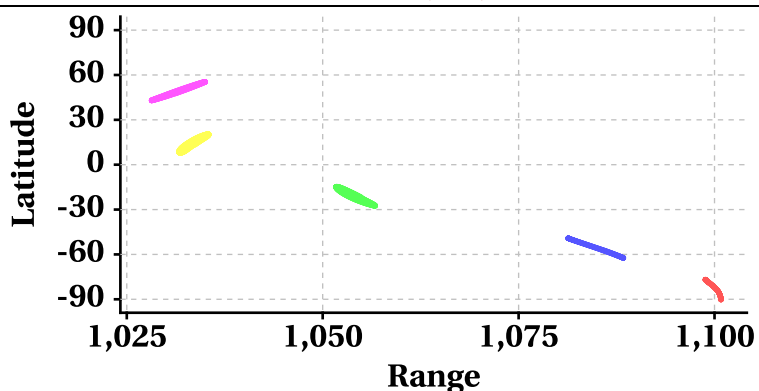
Incidence Angle at Scan Interval of 200 [Outer Beam (VV)]



Scan 0 Scan 200 Scan 400 Scan 600  
Scan 800

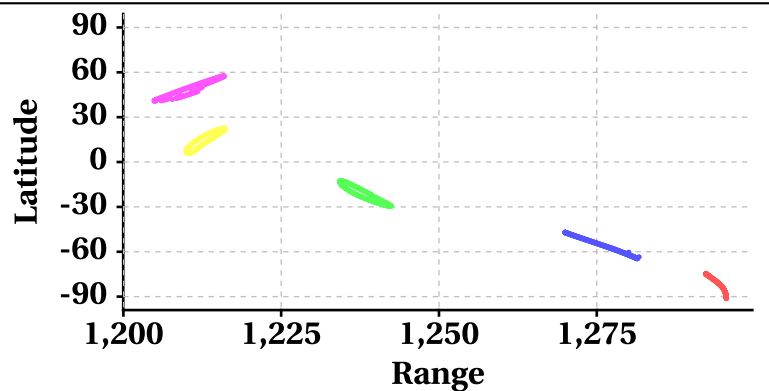
## Latitude Vs Range

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

