

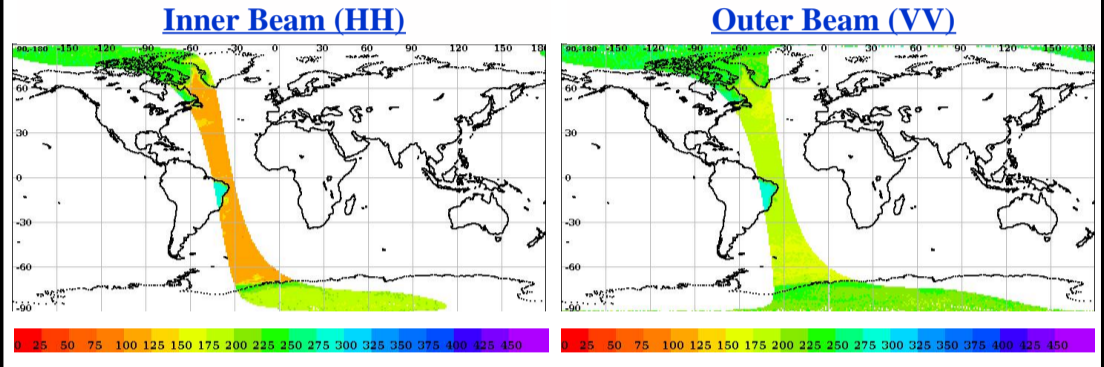
# SCATSAT-1 Scatterometer Level-1B Data Quality Evaluation Report

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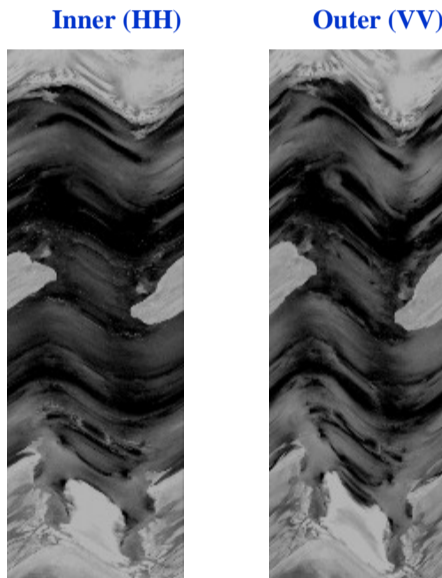
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|                              |               |                              |              |                               |      |
|------------------------------|---------------|------------------------------|--------------|-------------------------------|------|
| <b>Satellite Id</b>          | ScatSat-1     | <b>Start Orbit</b>           | 17265        | <b>Total Scans</b>            | 1017 |
| <b>Sensor Name</b>           | Scatterometer | <b>End Orbit</b>             | 17266        | <b>No of Inner FootPrints</b> | 281  |
| <b>Processor Version</b>     | v1.1.3        | <b>Rev. Number</b>           | 17265_17266  | <b>No Of Outer FootPrints</b> | 282  |
| <b>Half Orbit Direction</b>  | SN            | <b>Data Production Date</b>  | 01-01-2020   | <b>No. Of Inner Slices</b>    | 9    |
| <b>Equator Crossing Date</b> | 30-12-2019    | <b>Equator Crossing Time</b> | 22:55:46.000 | <b>No Of Outer Slices</b>     | 15   |

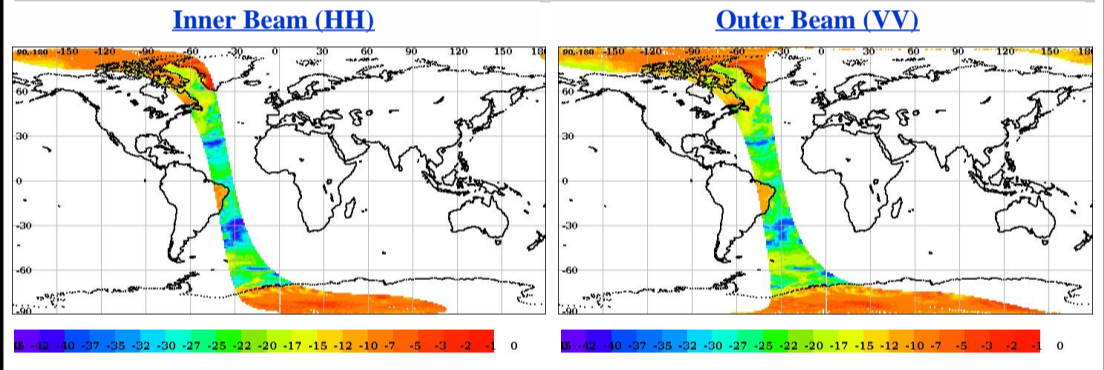
## Brightness Temperature(k) Footprint trace



## Image Snapshot for Inner & Outer Beam



## Sigma0(dB) Footprint trace



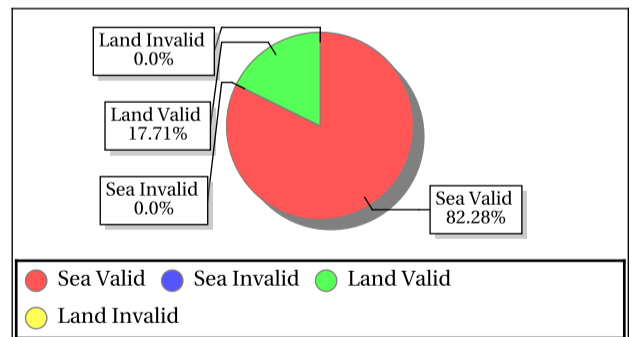
## Invalid and Poor Sigma-0 Quality Flag Statistics for Inner/Outer Slices\*

| Sigma-0 Flags                            | Inner Beam | Outer Beam |
|--|------------|------------|
| Invalid Sigma0(%)                        | 0.00       | 0.00       |
| Data Not Available From Payload (%)      | 100.0      | 78.94736   |
| Slice not within sample array limits (%) | 0.00       | 21.05      |
| 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 (%)                         | 0.045128   | 0.11288    |

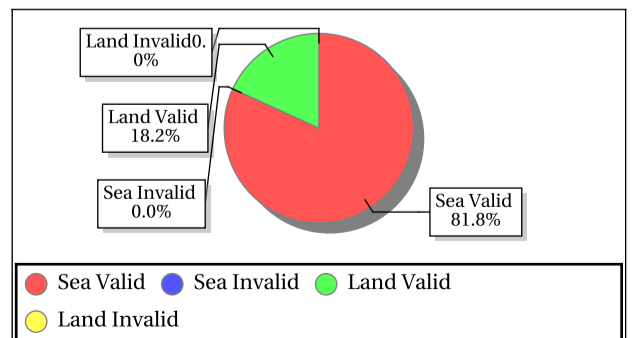
\*DP Format Document

## 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     | Outer | ASC  | Aft     | -5.86      | -4.17      | -4.93       | 0.35       | 205.53 | 244.33 | 222.90  | 9.46   |
| GreenLand_2 | 77.50      | -41.50     | Outer | ASC  | Fore    | -6.02      | -3.97      | -4.95       | 0.52       | 192.43 | 255.40 | 219.28  | 14.39  |
| GreenLand_3 | 71.55      | -42.45     | Outer | ASC  | Aft     | -11.82     | -9.80      | -10.78      | 0.49       | 179.94 | 257.07 | 225.71  | 19.04  |
| GreenLand_3 | 71.55      | -42.45     | Outer | ASC  | Fore    | -12.25     | -9.56      | -10.52      | 0.57       | 193.39 | 258.24 | 225.67  | 15.90  |
| GreenLand_1 | 74.69      | -42.50     | Outer | ASC  | Aft     | -10.14     | -8.08      | -9.06       | 0.55       | 198.91 | 256.94 | 228.08  | 14.30  |
| GreenLand_1 | 74.69      | -42.50     | Outer | ASC  | Fore    | -10.38     | -7.71      | -8.98       | 0.74       | 196.86 | 263.34 | 231.90  | 16.21  |



## 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    | 268.29 | 0.40 | 3.900        | 0.12     | 288.59 | 0.35 | 3.271        | 0.12     | 0.13  | 0.12  | 0.000        | 0.12      | 0.13  | 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>      | -34.42  | 22.50  | 3.58 | 0.014        | -34.74   | 24.26  | 5.14 | 0.784        | 6.52     | 29.40 | 20.48 | 26.382       | 7.84      | 30.38 | 21.14 | 33.472       |

| 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    | 214.74 | 0.41 | 4.399        | 0.09     | 232.86 | 0.38 | 4.001        | 0.09     | 0.12  | 0.09  | 0.000        | 0.09      | 0.11  | 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>      | -34.62  | 16.44  | 1.31 | 0.000        | -34.97   | 17.63  | 2.10 | 0.000        | 2.25     | 22.60 | 14.62 | 0.204        | 3.45      | 23.44 | 14.79 | 0.935        |

| 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> | 48.72           | 49.46   | 49.08   | 0.000        | 57.49           | 58.32   | 57.97   | 0.000        | Inci.(Inner)             | 47.10   | 49.90   |
| <b>Azimuth Diff. (deg)</b>   | 0.0029          | 215.06  | 1.27    | 2.672        | 0.0026          | 292.14  | 1.27    | 3.930        | Inci.(Outer)             | 57.30   | 58.90   |
| <b>Range(Km)</b>             | 1032.22         | 1086.42 | 1053.88 | 0.000        | 1209.43         | 1276.82 | 1234.28 | 0.022        | Azimuth Diff.            | 0.60    | 2.00    |
| <b>X Factor(dbm)</b>         | -91.86          | -90.03  | -90.50  | 0.000        | -93.21          | -92.08  | -92.31  | 0.000        | Range(Inner)             | 1025.00 | 1095.70 |
| <b>Across Distance (Km)</b>  | 15.40           | 15.91   | 15.62   | 0.000        | 10.07           | 53.93   | 20.85   | 7.000        | Range(Outer)             | 1210.00 | 1280.00 |
| <b>Along Distance (Km)</b>   | 18.82           | 20.61   | 19.74   | 0.000        | 18.67           | 20.83   | 19.64   | 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   |
|                              |                 |         |         |              |                 |         |         |              |                          |         |         |

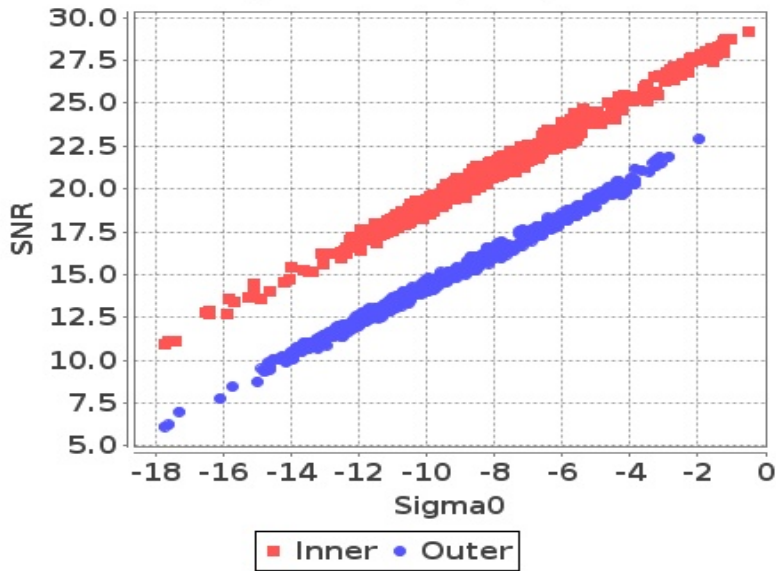
- Normal
- Deviations
- Alarming
- High Errors



# Sigma0 Behaviour (Sigma0 Vs SNR)

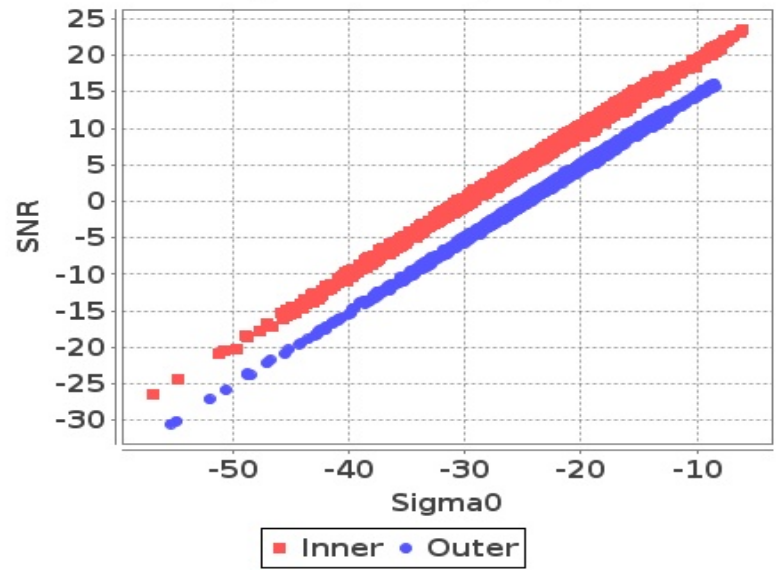
Footprint-Land

Sigma0 Vs SNR (Land)



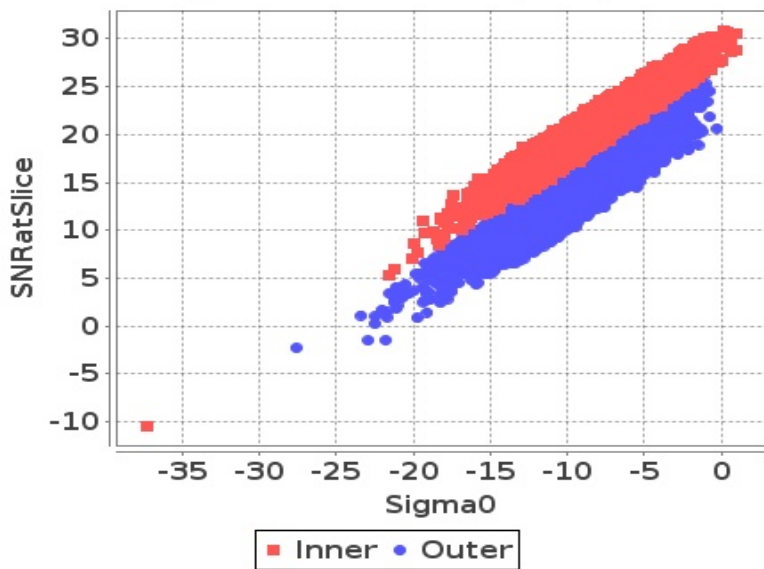
Footprint-Sea

Sigma0 Vs SNR (Sea)



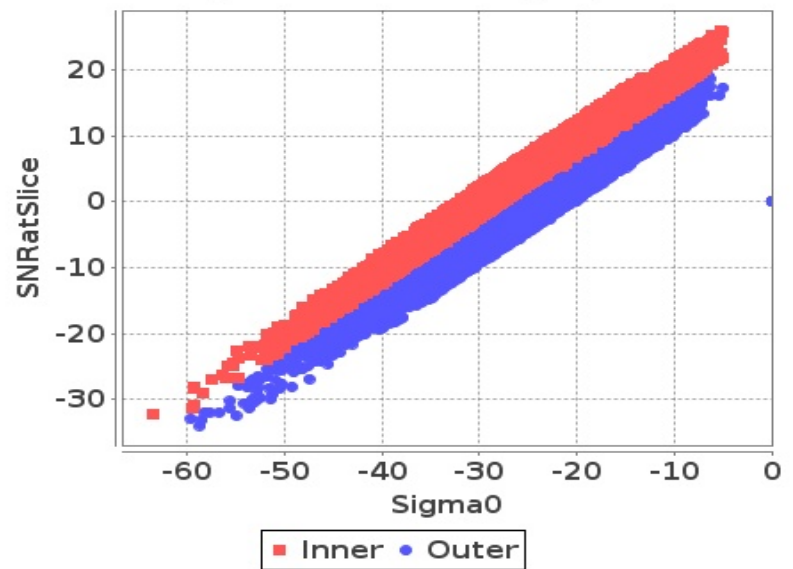
Slice-Land

Sigma0 Vs SNRatSlice (Land)



Slice-Sea

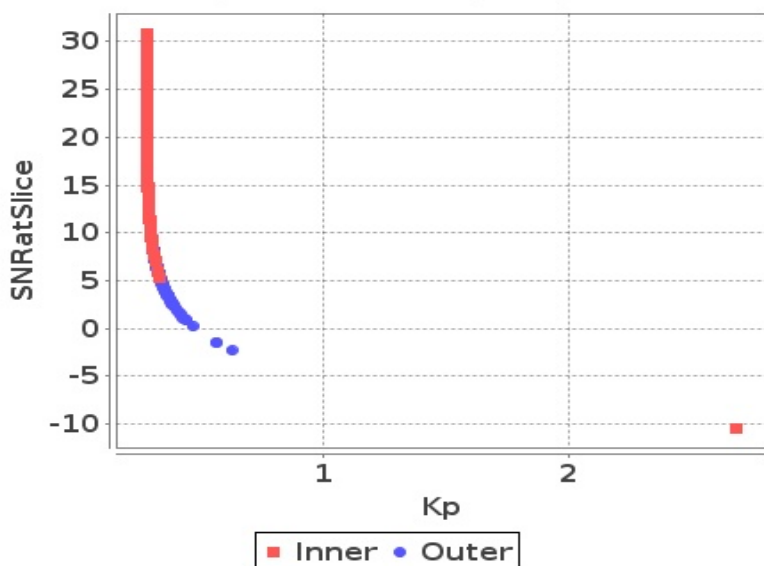
Sigma0 Vs SNRatSlice (Sea)



# Sigma0 Behaviour (Kp Vs SNR)

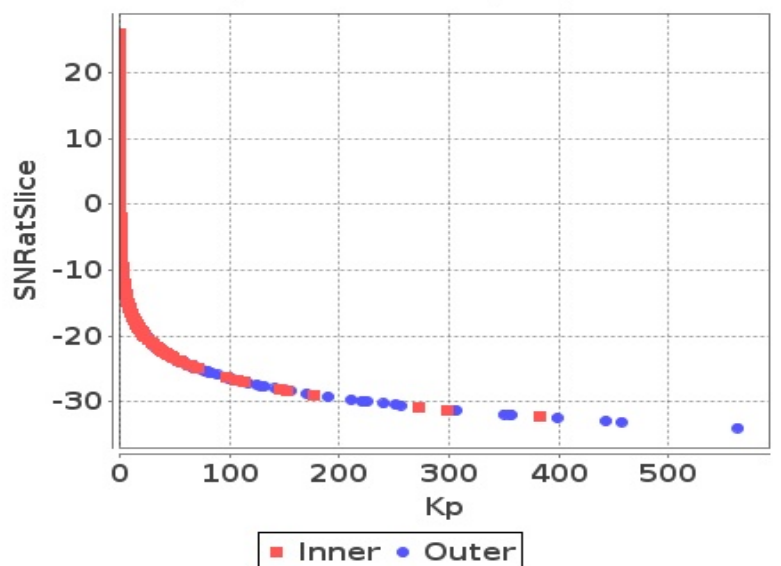
Slice

Kp Vs SNRatSlice (Land)



Slice

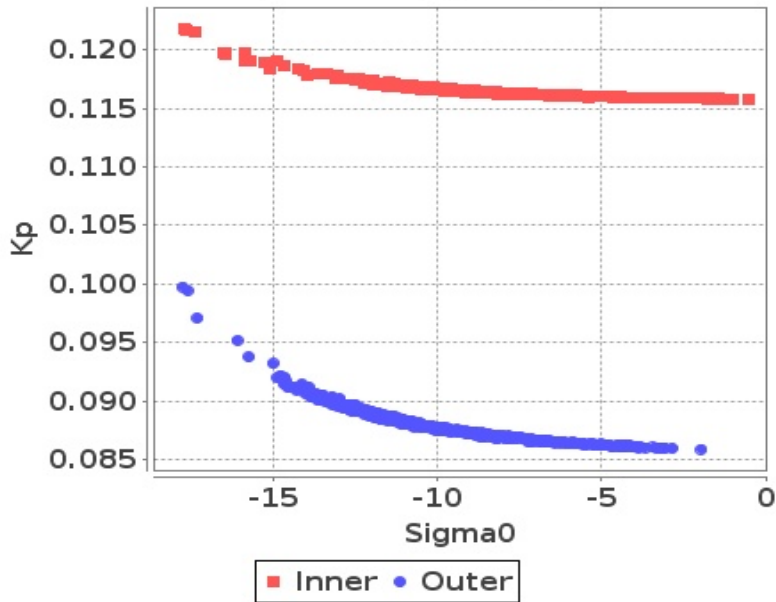
Kp Vs SNRatSlice (Sea)



# Sigma0 Behaviour(Sigma0 Vs Kp)

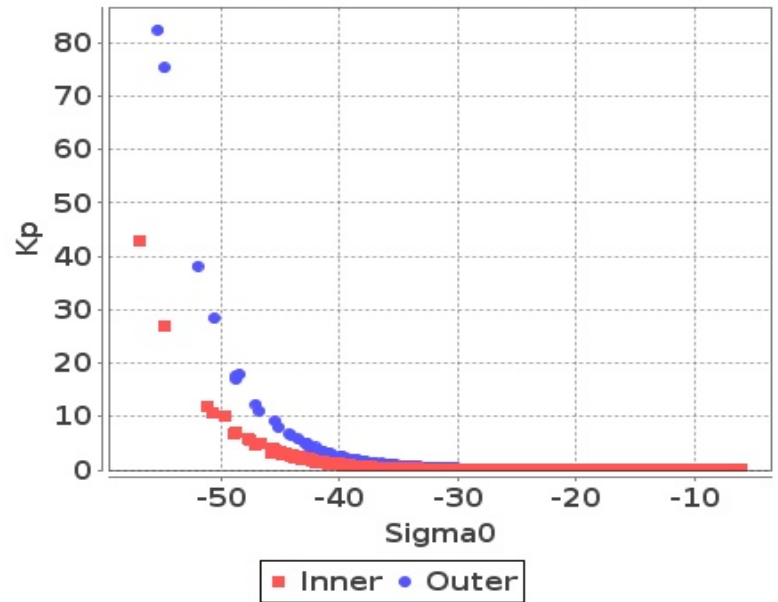
## Footprint-Land

### Sigma0 Vs Kp (Land)



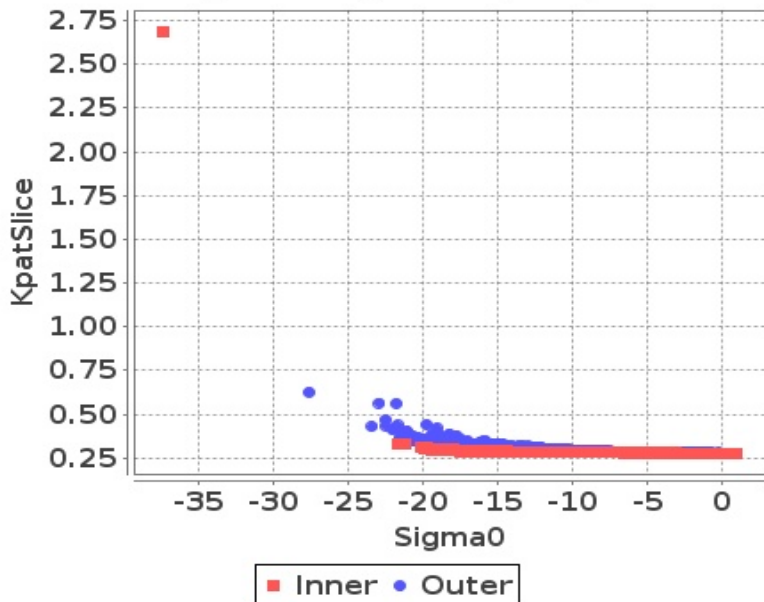
## Footprint-Sea

### Sigma0 Vs Kp (Sea)



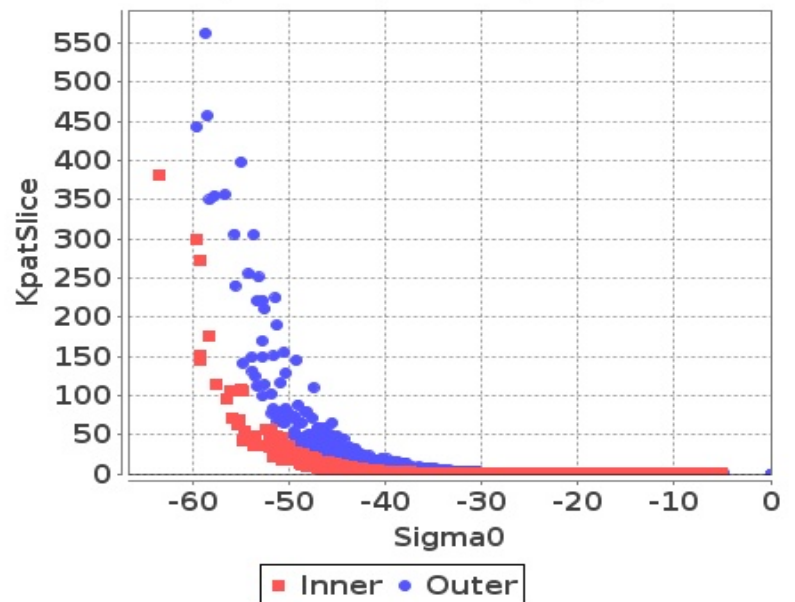
## Slice-Land

### Sigma0 Vs KpatSlice (Land)



## Slice-Sea

### Sigma0 Vs KpatSlice (Sea)



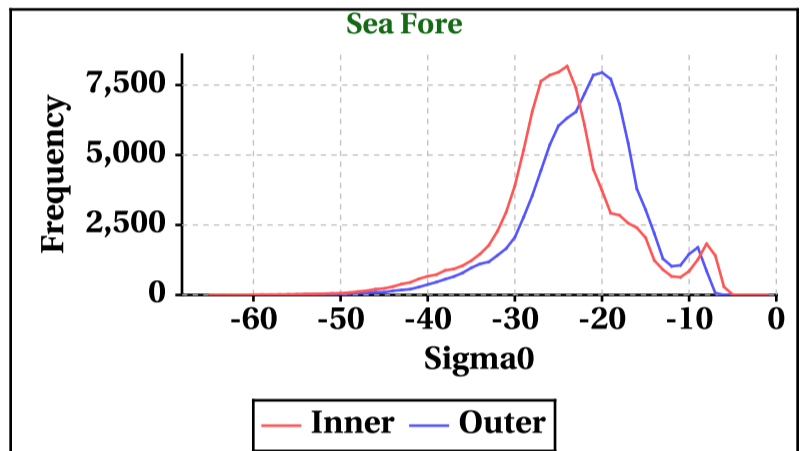
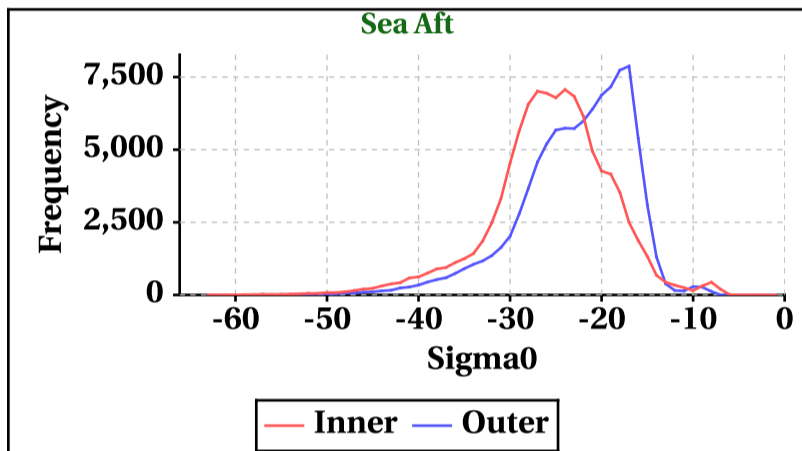
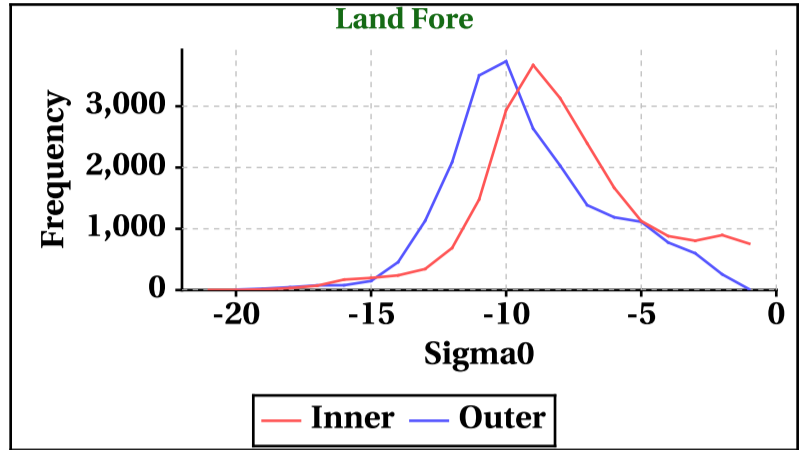
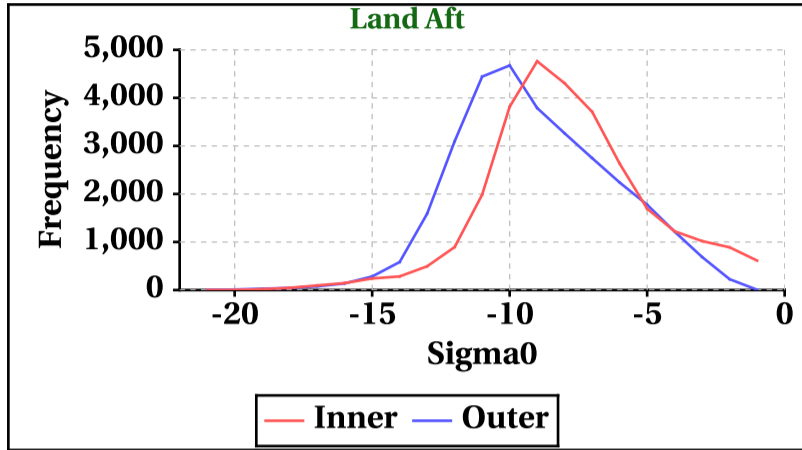


# Dynamic Range (Data Histograms)

## Sigma0(db)

| Inner Beam (HH) |          |           |         |          |
|-----------------|----------|-----------|---------|----------|
|                 | Land Aft | Land Fore | Sea Aft | Sea Fore |
| Min             | -21      | -21       | -63     | -65      |
| Max             | 0        | 0         | 0       | 0        |

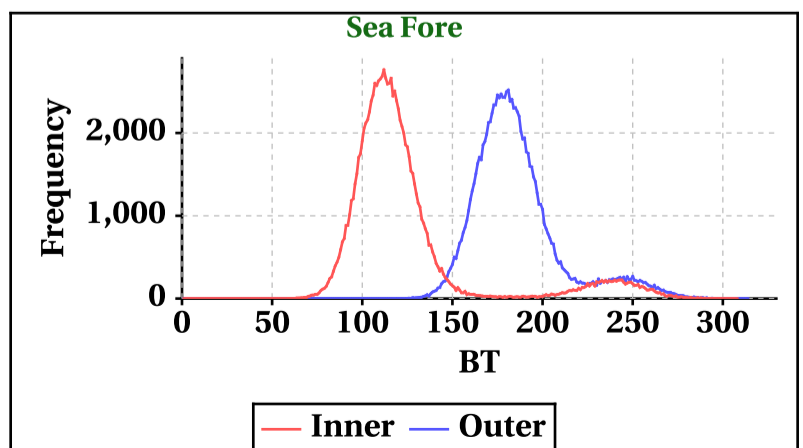
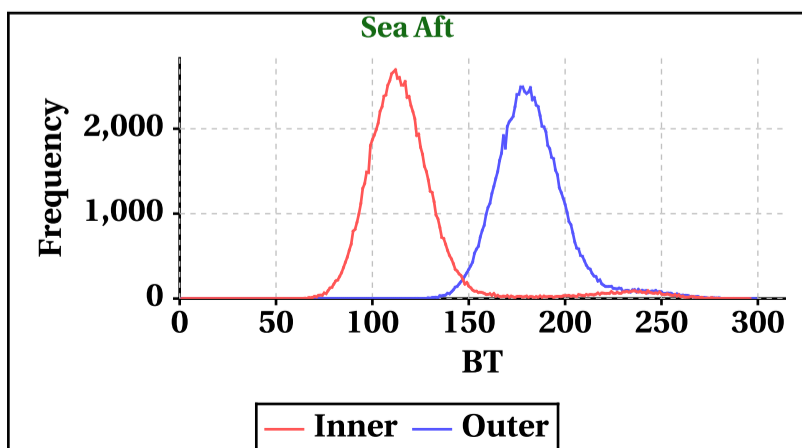
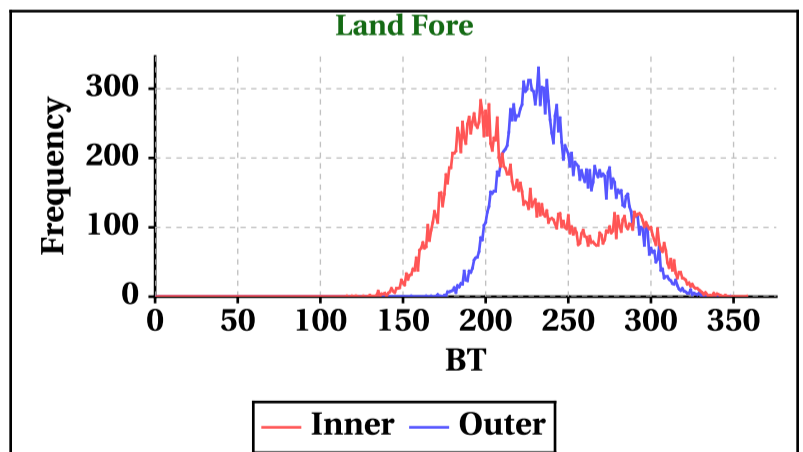
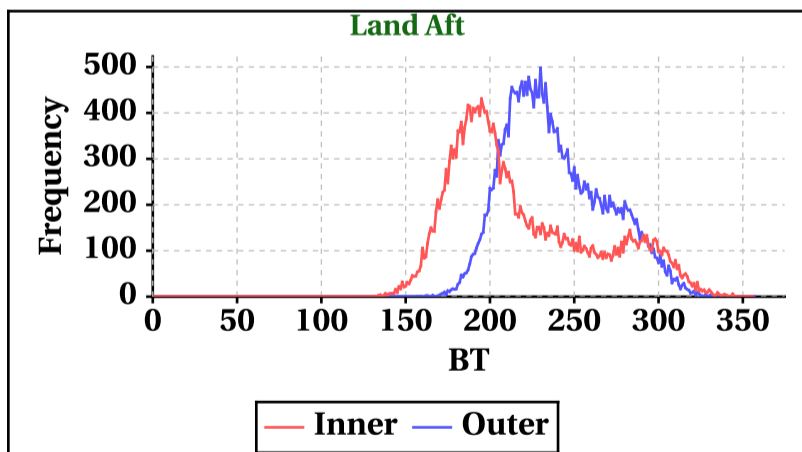
| Outer Beam (VV) |          |           |         |          |
|-----------------|----------|-----------|---------|----------|
|                 | Land Aft | Land Fore | Sea Aft | Sea Fore |
| Min             | -21      | -20       | -59     | -59      |
| Max             | 0        | 0         | 0       | 0        |



## Brightness Temperature(K)

| Inner Beam(HH) |          |           |         |          |
|----------------|----------|-----------|---------|----------|
|                | Land Aft | Land Fore | Sea Aft | Sea Fore |
| Min            | 0        | 0         | 0       | 0        |
| Max            | 356      | 358       | 296     | 308      |

| Outer Beam(VV) |          |           |         |          |
|----------------|----------|-----------|---------|----------|
|                | Land Aft | Land Fore | Sea Aft | Sea Fore |
| Min            | 0        | 0         | 0       | 0        |
| Max            | 357      | 348       | 299     | 314      |

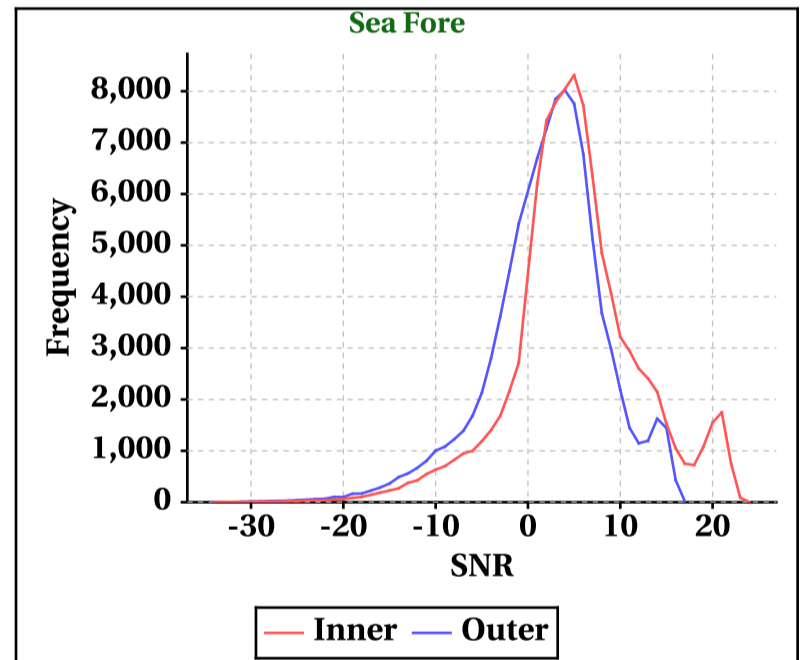
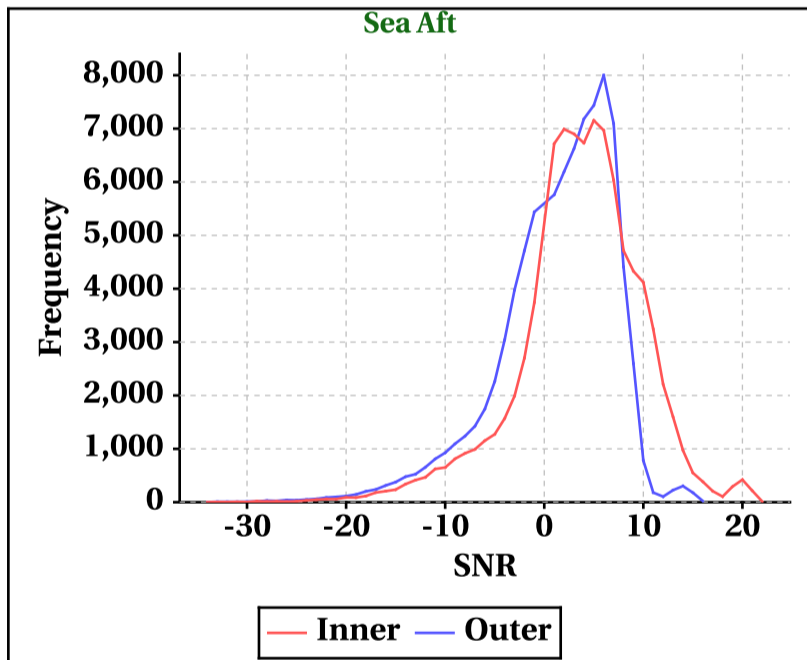
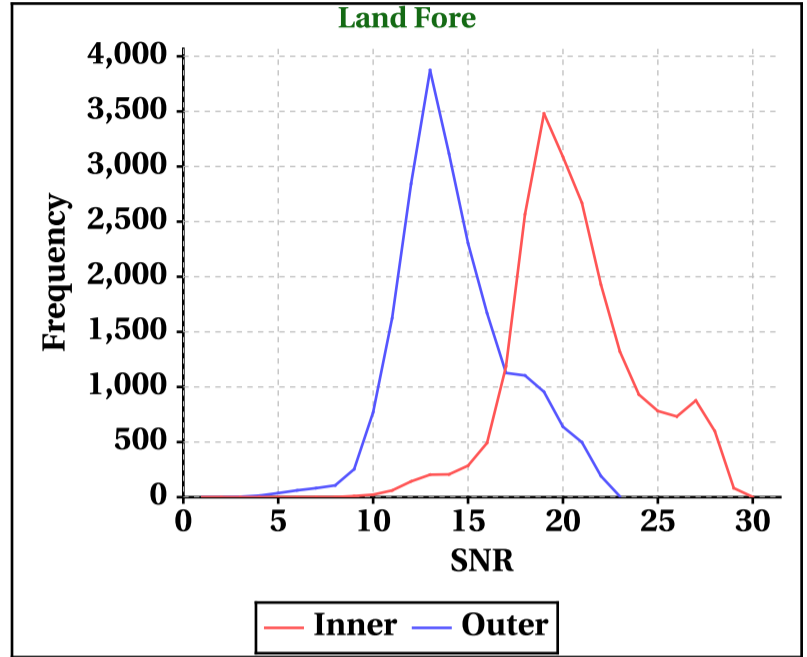
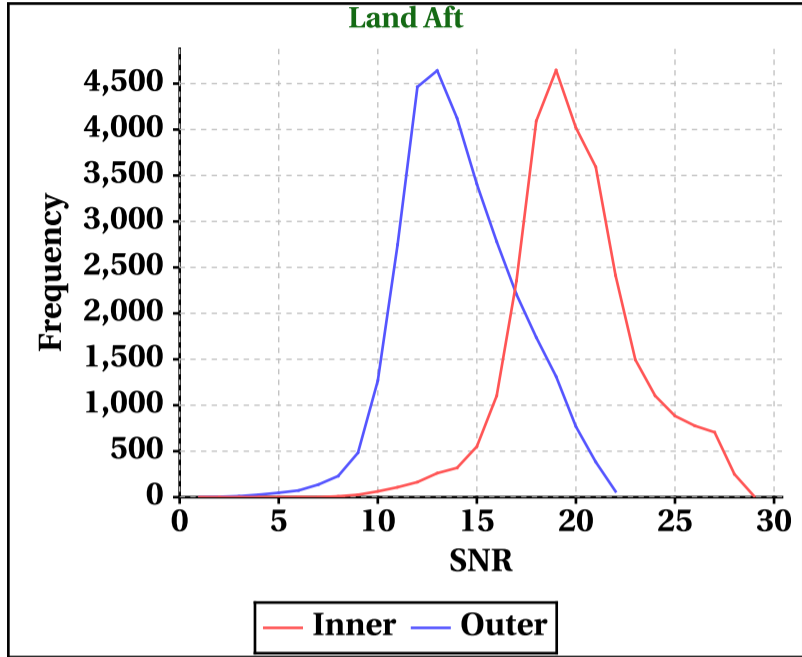


# Dynamic Range (Data Histograms)

## SNR(dBm)

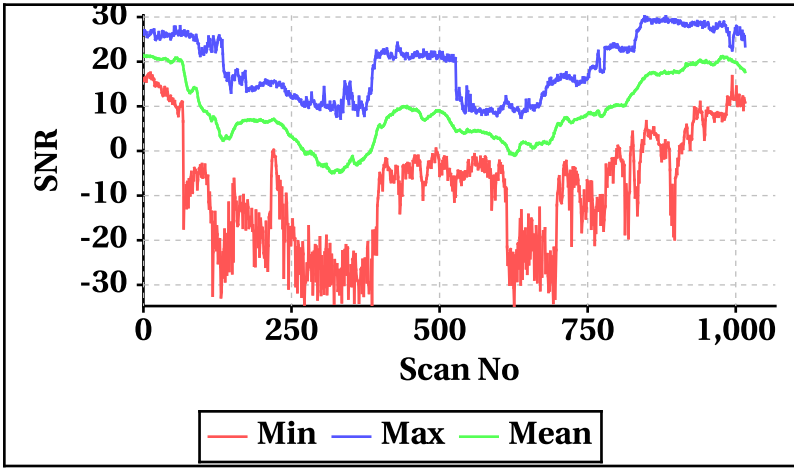
| Inner Beam (HH) |          |           |         |          |
|-----------------|----------|-----------|---------|----------|
|                 | Land Aft | Land Fore | Sea Aft | Sea Fore |
| Min             | 0        | 0         | -34     | -34      |
| Max             | 29       | 30        | 22      | 24       |

| Outer Beam (VV) |          |           |         |          |
|-----------------|----------|-----------|---------|----------|
|                 | Land Aft | Land Fore | Sea Aft | Sea Fore |
| Min             | 0        | 0         | -34     | -34      |
| Max             | 22       | 23        | 16      | 17       |

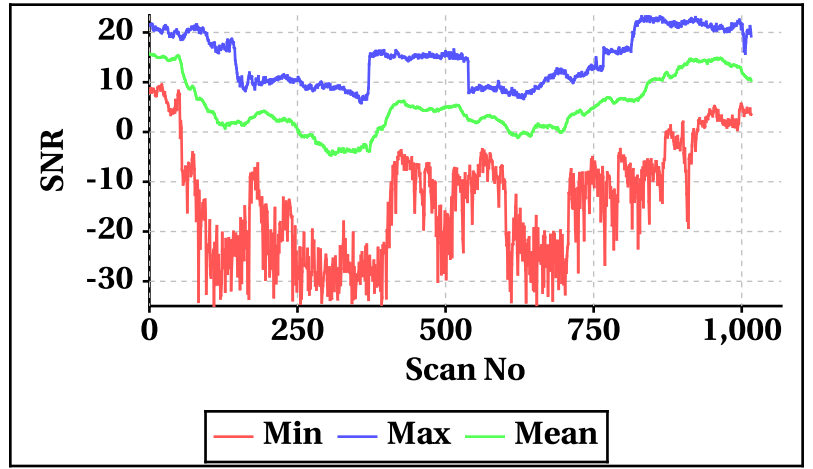


## Orbit-wise behaviour of SNR

**Inner Beam (HH)**

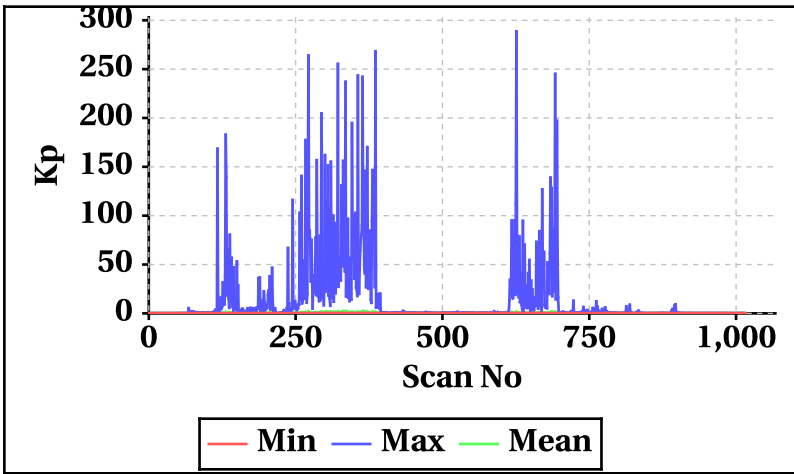


**Outer Beam(VV)**

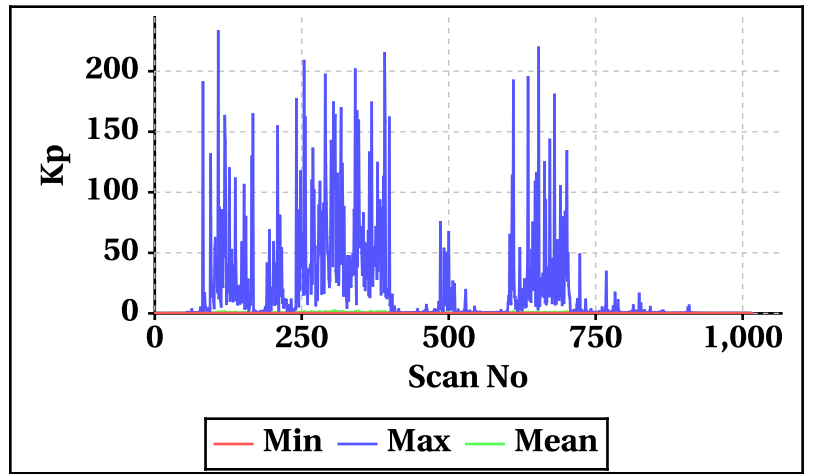


## Orbit-wise behaviour of Kp,Kpa,Kpb,Kpc

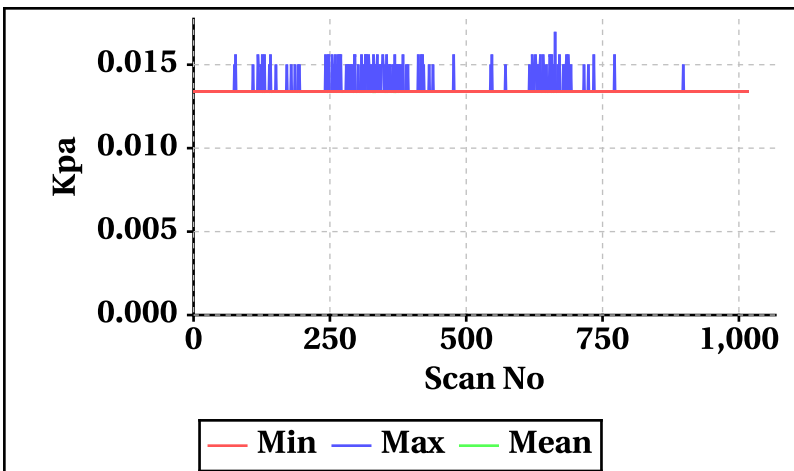
**Inner Beam(HH)**



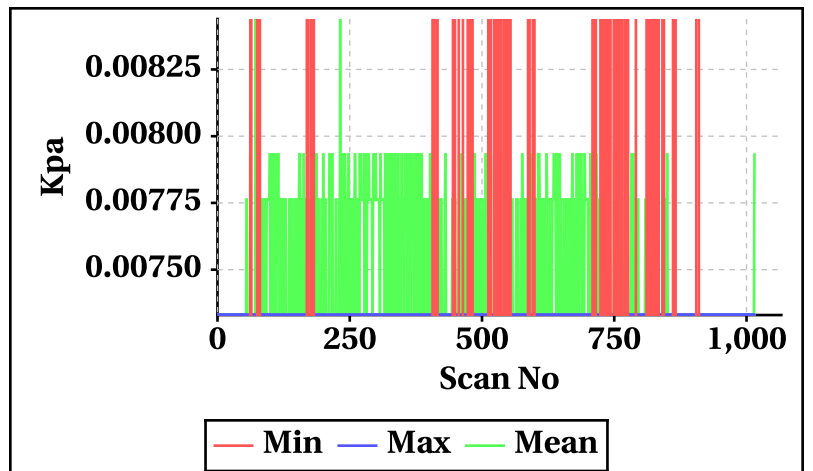
**Outer Beam(VV)**



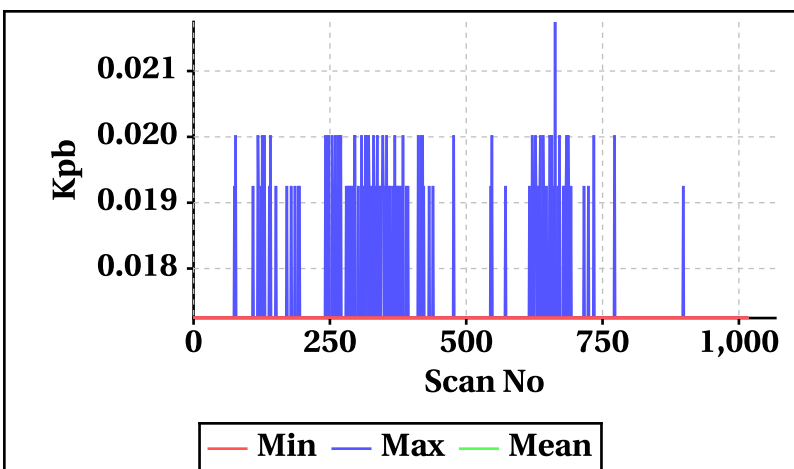
**Inner Beam(HH)**



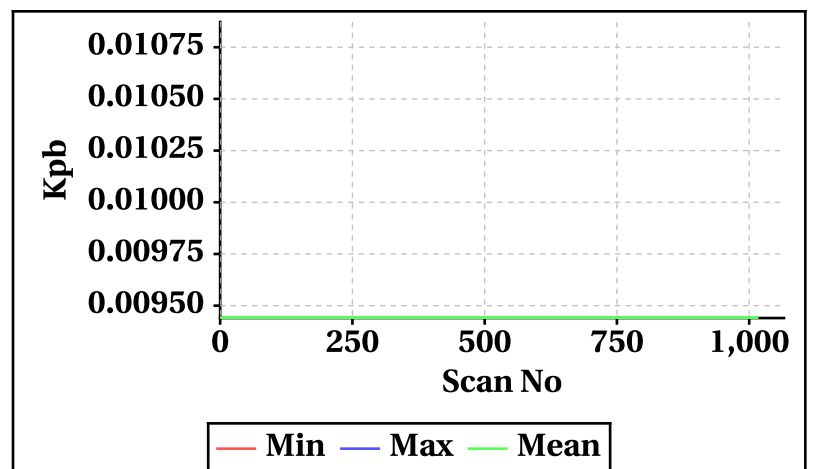
**Outer Beam(VV)**



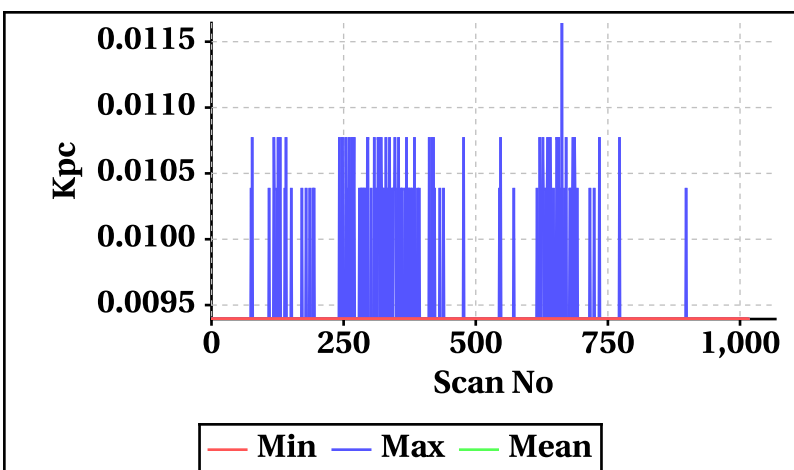
**Inner Beam(HH)**



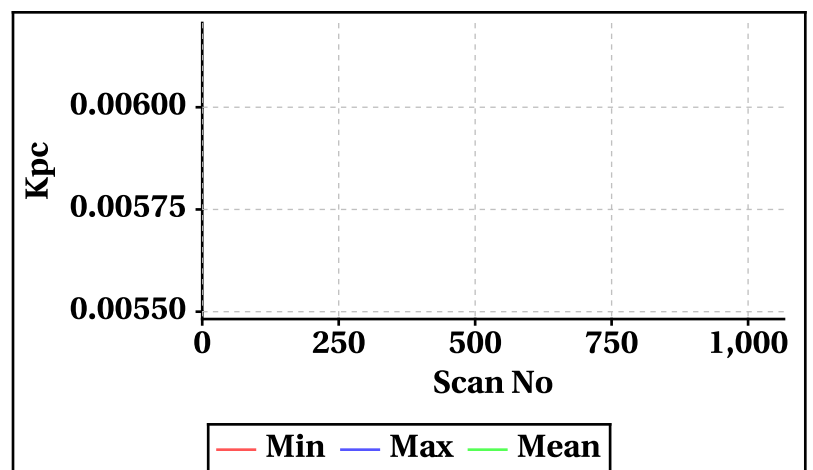
**Outer Beam(VV)**



**Inner Beam(HH)**



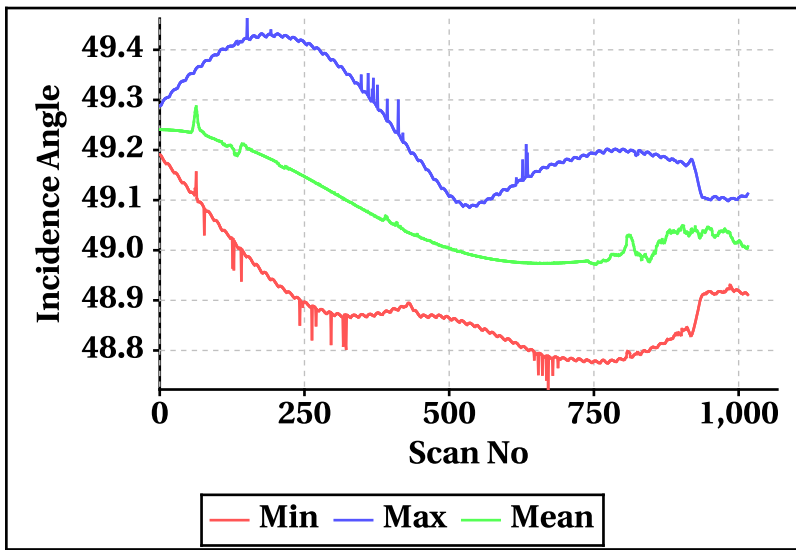
**Outer Beam(VV)**



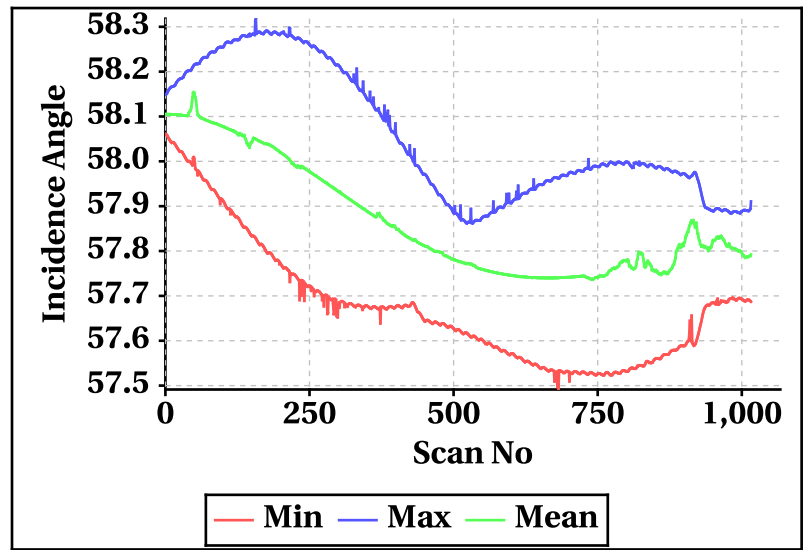


Orbit-wise behaviour of Incidence,Azimuth,Range,X-Factor

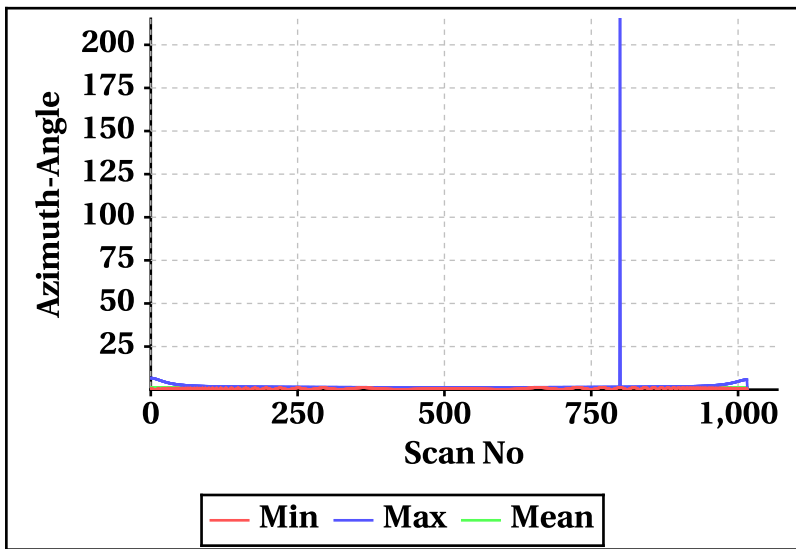
Inner Beam (HH)



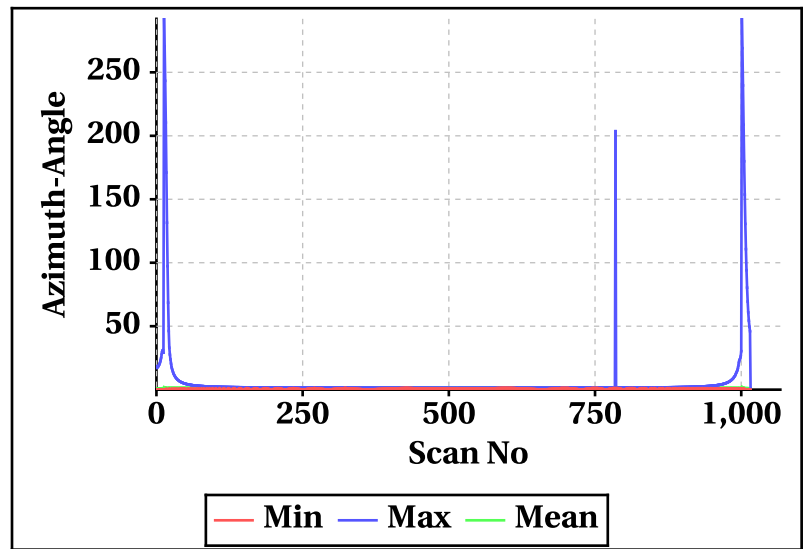
Outer Beam(VV)



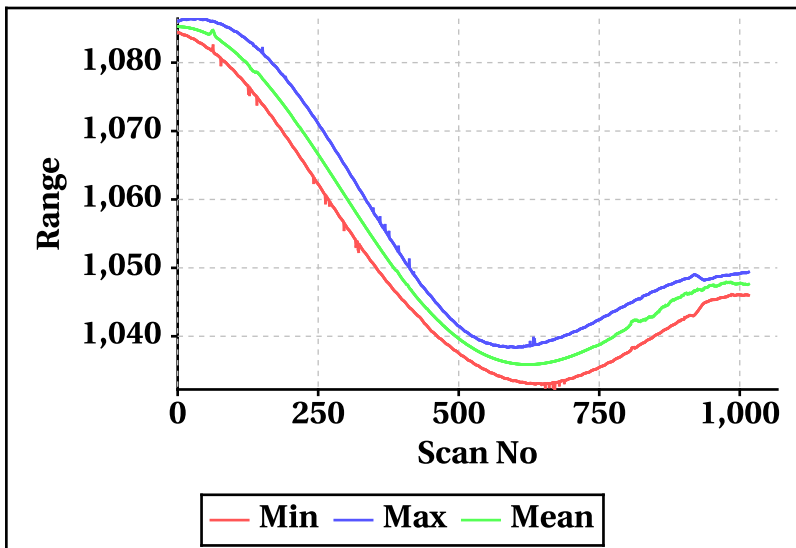
Inner Beam (HH)



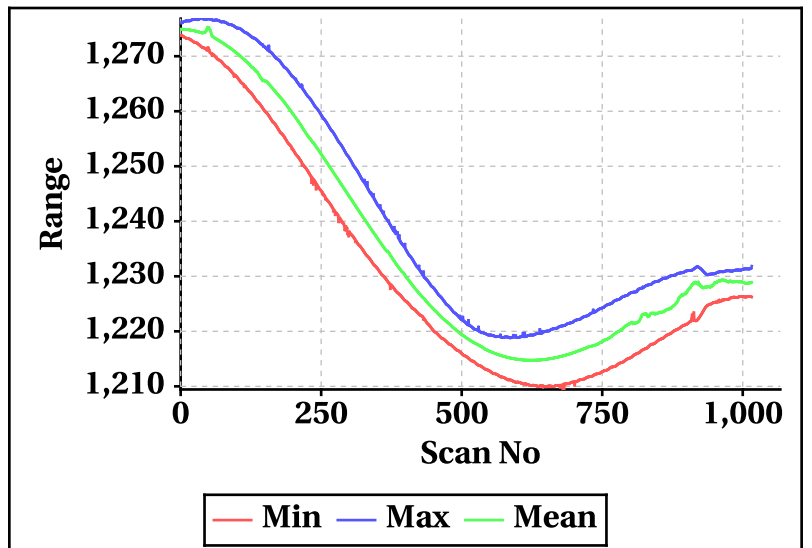
Outer Beam(VV)



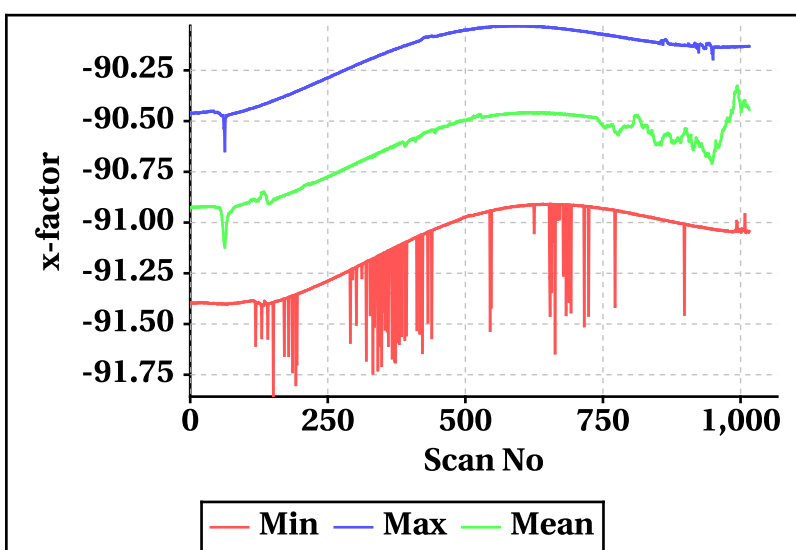
Inner Beam (HH)



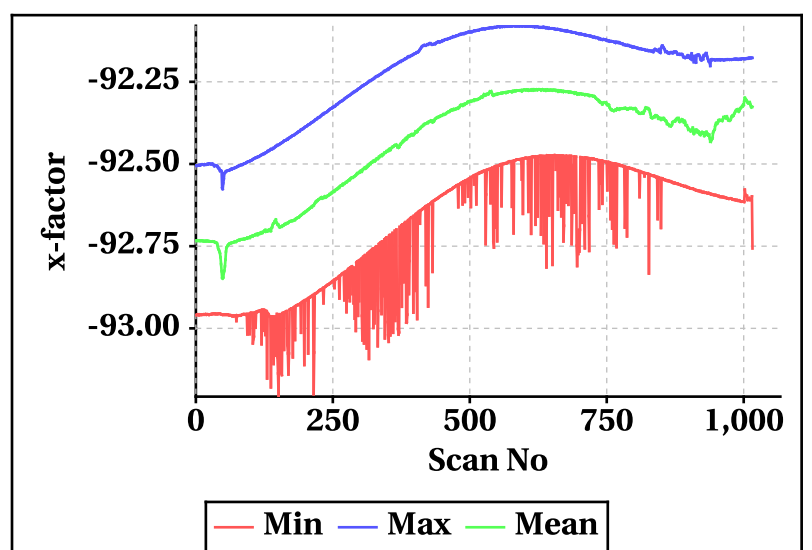
Outer Beam(VV)



Inner Beam (HH)



Outer Beam(VV)

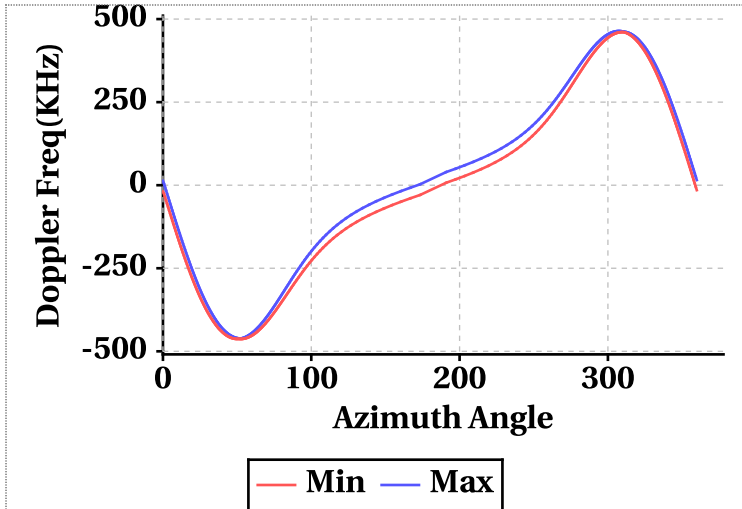


# Doppler Frequency Variation

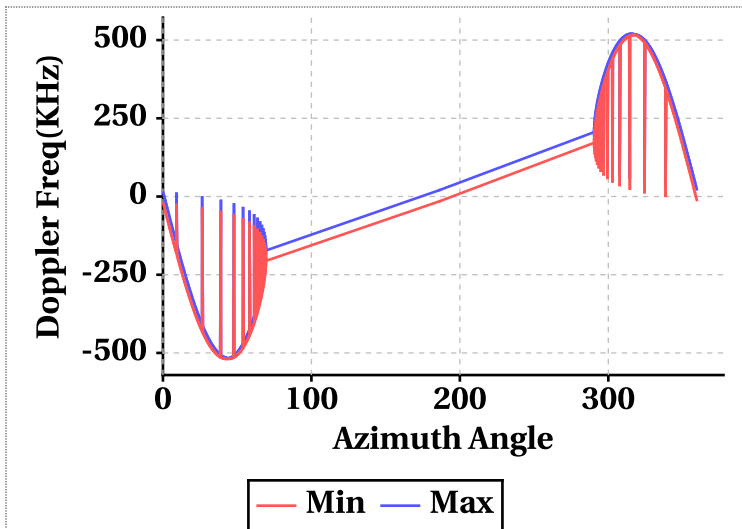
Doppler Frequency(KHz) variation statistics Over the half Orbit

|     | Inner Beam (HH) | Outer Beam (VV) |
|-----|-----------------|-----------------|
| Min | -462.90         | -518.76         |
| Max | 463.96          | 519.80          |

Footprint wise Doppler frequency variation Inner Beam (HH)



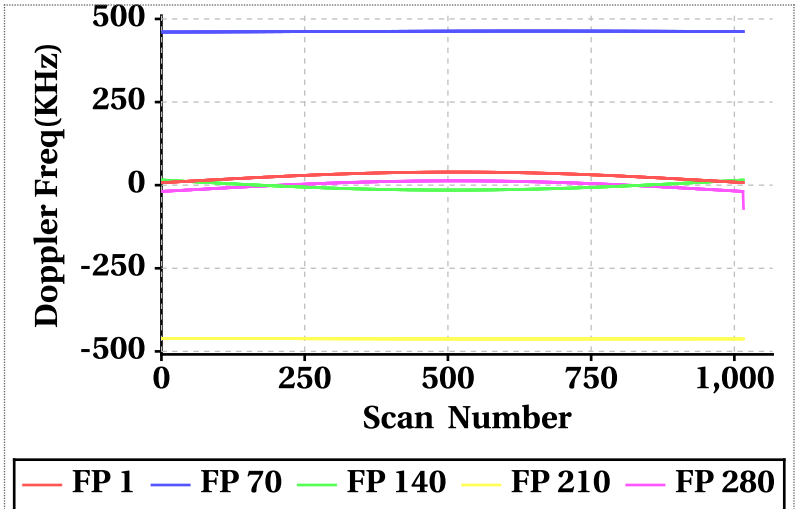
Footprint wise Doppler frequency variation Outer Beam (VV)



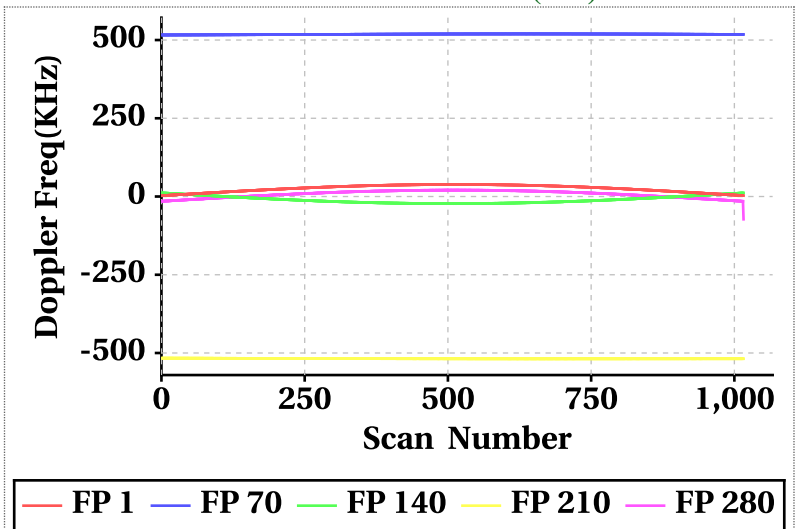
Doppler Frequency(KHz) variation

| Doppler_FP  | Inner Beam (HH) |         |         | Outer Beam (VV) |         |         |
|-------------|-----------------|---------|---------|-----------------|---------|---------|
|             | Min             | Max     | Mean    | Min             | Max     | Mean    |
| Doppler_1   | 7.26            | 39.44   | 27.78   | 2.58            | 38.42   | 25.43   |
| Doppler_70  | 460.62          | 463.54  | 462.51  | 516.14          | 519.56  | 518.40  |
| Doppler_140 | -14.90          | 15.50   | -3.86   | -22.70          | 11.60   | -10.24  |
| Doppler_210 | -462.70         | -460.72 | -462.18 | -518.60         | -516.52 | -518.03 |
| Doppler_280 | -70.28          | 13.10   | 1.31    | -72.88          | 20.44   | 7.29    |

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

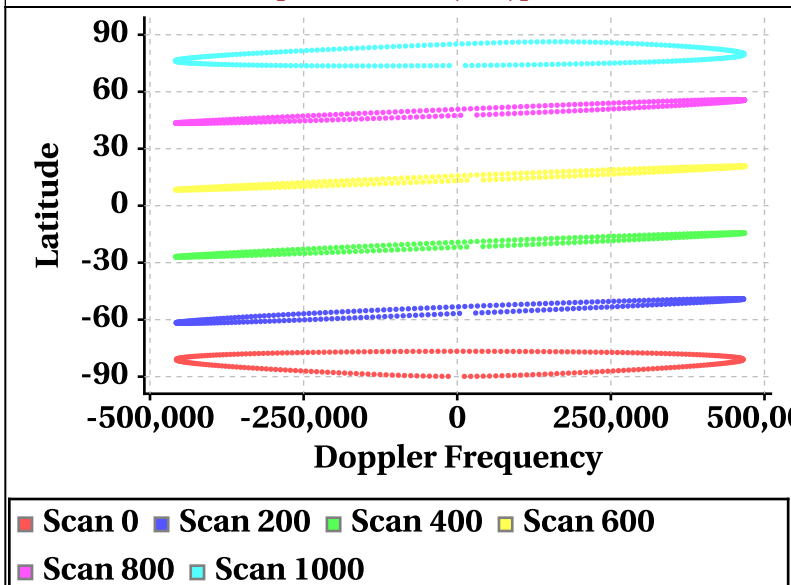


Doppler frequency variation at footprints: 1, 70, 140, 210 & 280 Outer Beam (VV)

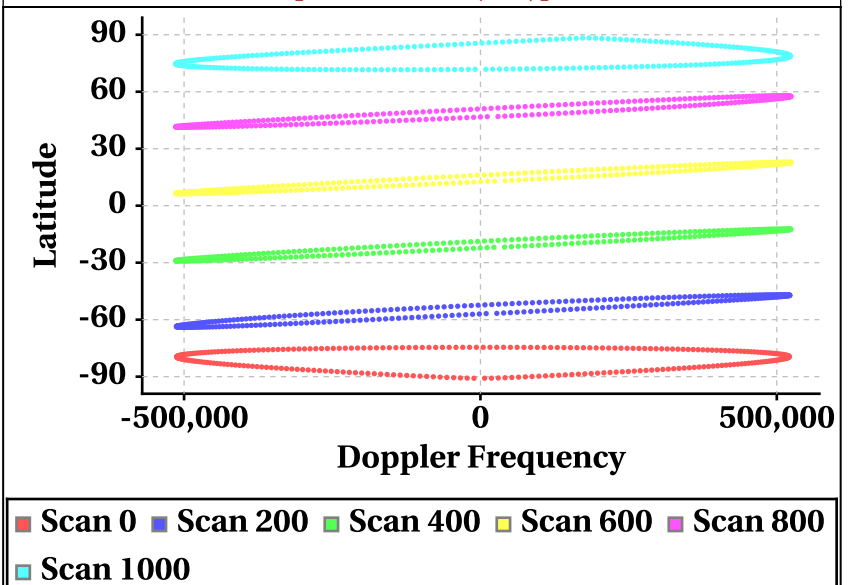


# Latitude Vs Doppler Frequency

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



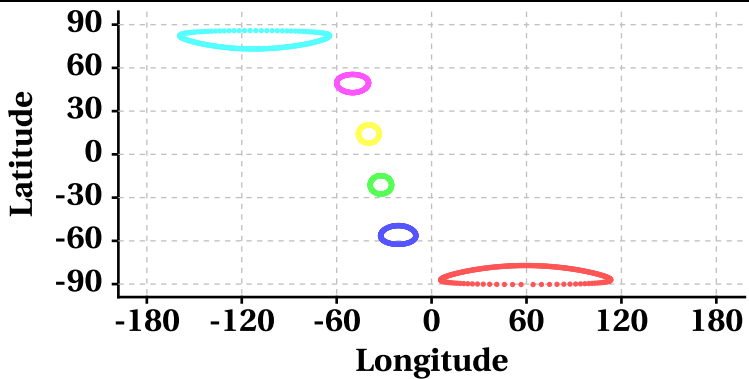
Doppler Frequency at Scan Interval of 200 [Outer Beam(VV)]



# Parameter as a function of Latitude

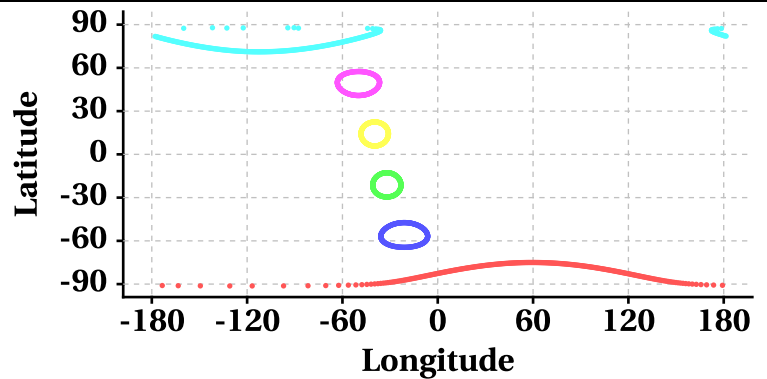
## Latitude Vs Longitude

Scan Trace [Inner Beam(HH)]



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

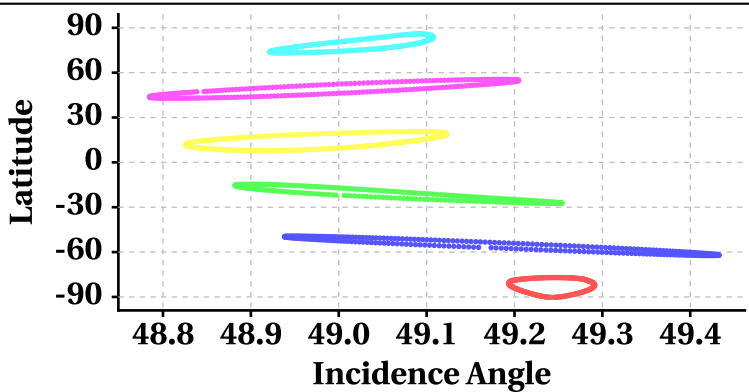
Scan Trace [Outer Beam (VV)]



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

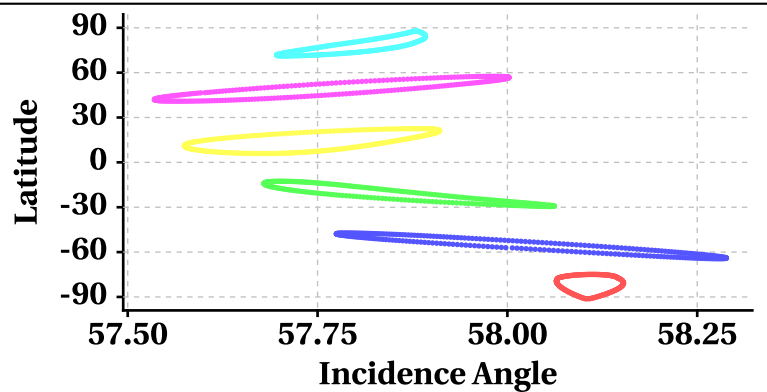
## Latitude Vs Incidence Angle

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



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

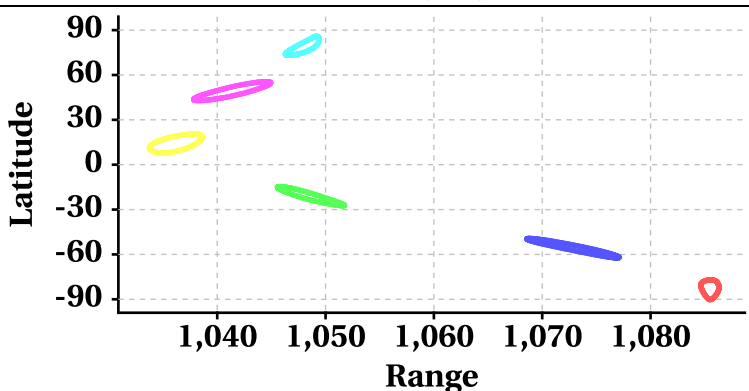
Incidence Angle at Scan Interval of 200 [Outer Beam (VV)]



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

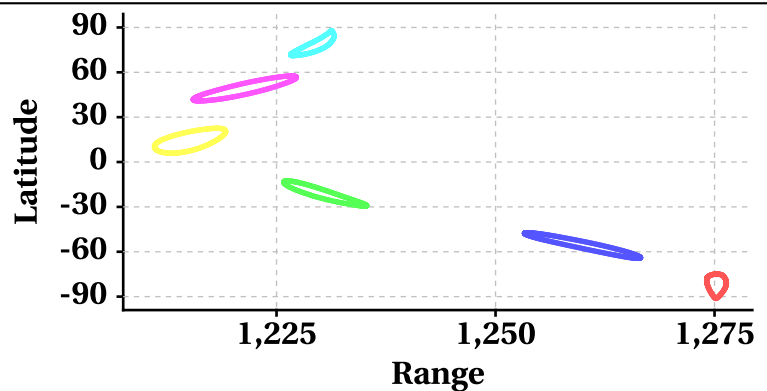
## Latitude Vs Range

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

