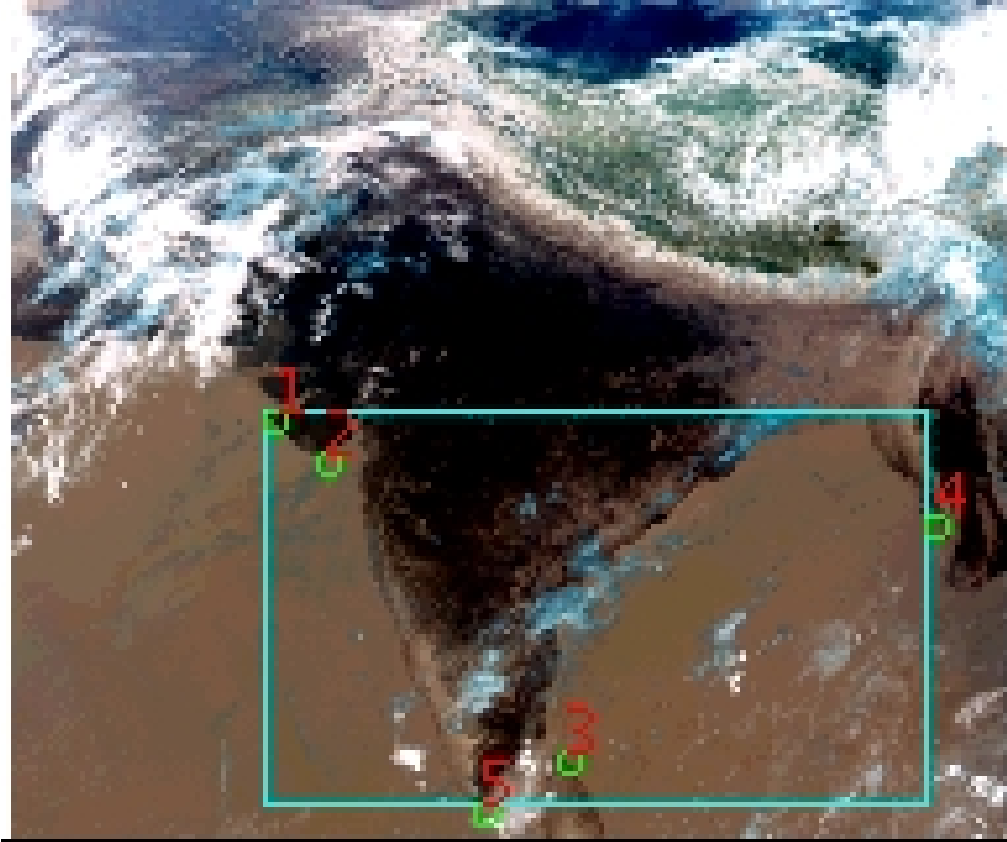


# DQE Report: Location Accuracy of INSAT-3D-SND STANDARD Product 3DSND\_02MAY2017\_0300

**Satellite** INSAT-3D      **No Of Bands** 19      **Product Type** STANDARD  
**Sensor** SND      **LvlOfProcess** L1B      **Selected Band** 2-LWIR3  
**DOP/Time** 02-05-17/03:00      **Station ID** BES      **Field View(deg)** 6.136  
**Res(Y,X) [Km]** (10.0,10.0)      **Res(Y,X) [uRad]** (280.0,280.0)

(41.455N,50.793W)

(41.455N,101.264E)



(6.875S,50.793W)

(6.875S,101.264E)

GCP Distribution overview for 3DSND02MAY20170300L1BSA1

**Image Width:** 384      **Image Height:** 320      **No Of GCPs:** 5

**GCP Coverage(%)**      46.33      **(N-S)** 65.23      **(E-W)**

## Location Error(E)

**Legend**      — 0Km < E <= 50Km      — 50Km < E <= 100Km      — E >100Km

## Location Error (In IR Pixels)

|        | Mean   | Direction | Stddev | RMS   |
|--------|--------|-----------|--------|-------|
| Along  | 0.478  | N         | 0.880  | 1.001 |
| Across | -0.184 | W         | 1.090  | 1.105 |

## Scale (Km)

|         | Pixel Size | Stddev | %variation |
|---------|------------|--------|------------|
| Average | 10.562     | 0.504  | 5.617      |
| Along   | 10.559     | 0.090  | 5.586      |
| Across  | 10.451     | 0.016  | 4.514      |

## Internal Distortion (in IR Pixels)

|        | PeakToPeak | Mean   | Stddev | RMS   |
|--------|------------|--------|--------|-------|
| Along  | 2.536      | -0.001 | 0.94   | 0.943 |
| Across | 2.878      | -0.791 | 1.13   | 1.378 |

## Attitude Residuals (Deg)

| Pitch    | Roll     | Yaw     |
|----------|----------|---------|
| -0.00565 | -0.00429 | 0.51979 |

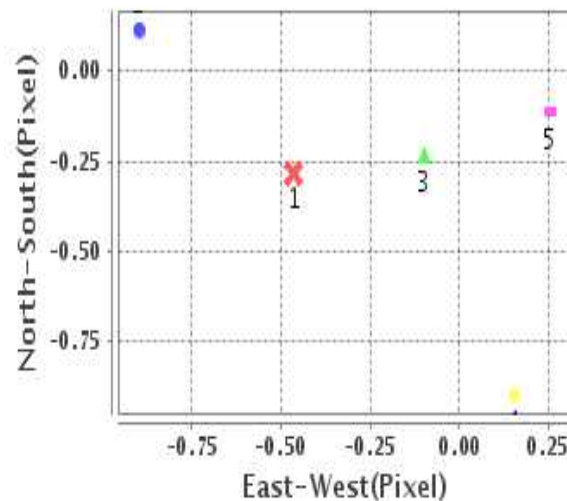
## Reference Used

| Sensor | Resolution | Projection |
|--------|------------|------------|
| ETM    | 500.00     | GPP        |

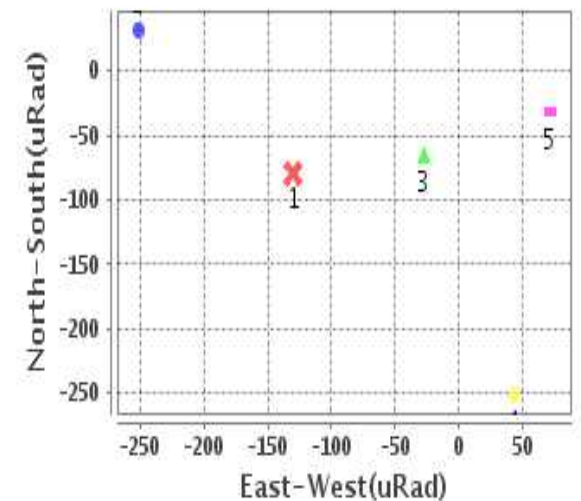
## Radial Error (in IR Pixels)

|             |       |
|-------------|-------|
| <b>Mean</b> | 1.216 |
| <b>Min</b>  | .319  |
| <b>Max</b>  | 2.302 |
| <b>CE90</b> | 2.187 |

## Location Error For GCPs(Pixel)



## Location Error For GCPs(uRad)



## Detailed Product Information

### Ancillary Info

|                          |              |                                  |            |
|--------------------------|--------------|----------------------------------|------------|
| <b>Satellite</b>         | INSAT-3D     | <b>Generation Date</b>           | 02-05-17   |
| <b>Sensor</b>            | SND          | <b>DQE Date</b>                  | 03-05-2017 |
| <b>PassType</b>          | NONE         | <b>Aquisition Date</b>           | 02-05-17   |
| <b>Imaging Mode</b>      | FULL_FRAME   | <b>Aquisition Time(GMT)</b>      | 03:00      |
| <b>Sat Altitude(m)</b>   | 3.6E7        | <b>Nominal Altitude(Km)</b>      | 3.6E7      |
| <b>Station</b>           | BES          | <b>Predicted Altitude(Km)</b>    | -999.99    |
| <b>Sat Location(deg)</b> | -999.99 E    | <b>Nominal Center Lat(deg)</b>   | 0.0        |
| <b>Format</b>            | hdf5-1.8.8   | <b>Nominal Center Lon(deg)</b>   | 82.0       |
| <b>LvlOfProcessing</b>   | STANDARD     | <b>Predicted Center Lat(deg)</b> | -999.99    |
| <b>DP JobId</b>          | 3DSND_02MAY2 | <b>Predicted Center Lon(deg)</b> | -999.99    |
| <b>ProductCode</b>       | NONE         |                                  |            |
| <b>Field View(deg)</b>   | 6.136        |                                  |            |

### Projection Parameters

|                                      |          |
|--------------------------------------|----------|
| <b>Projection</b>                    | None     |
| <b>Ellipsoid</b>                     | WGS_84   |
| <b>Datum</b>                         | WGS_84   |
| <b>Zone</b>                          | NotAvail |
| <b>Semi_Major_Axis(Km)</b>           | 6378.14  |
| <b>Semi_Minor_Axis(Km)</b>           | 6356.75  |
| <b>Standard_Parallel1(deg)</b>       | -999.99  |
| <b>Standard_Parallel2(deg)</b>       | -999.99  |
| <b>Projection_Origin_Lon(deg)</b>    | -999.99  |
| <b>Projection_Origin_Lat(deg)</b>    | -999.99  |
| <b>Projection_False_Easting(Km)</b>  | -999.99  |
| <b>Projection_False_Northing(Km)</b> | -999.99  |

### Scene Center Desc

|                          |         |
|--------------------------|---------|
| <b>Centre Lat(deg)</b>   | 24.165  |
| <b>Center Lon(deg)</b>   | 76.029  |
| <b>Centre Roll(deg)</b>  | -999.0  |
| <b>Centre Pitch(deg)</b> | -999.0  |
| <b>Center Yaw(deg)</b>   | -999.0  |
| <b>SunElevation(deg)</b> | -999.99 |
| <b>SunAzimuth(deg)</b>   | -999.99 |
| <b>SatElevation(deg)</b> | -999.99 |
| <b>SatAzimuth(deg)</b>   | -999.99 |

### Scene Corner Desc

|                    |         |
|--------------------|---------|
| <b>NW_Lat(deg)</b> | 41.455  |
| <b>NW_Lon(deg)</b> | 50.793  |
| <b>SW_Lat(deg)</b> | 6.875   |
| <b>SW_Lon(deg)</b> | 50.793  |
| <b>NE_Lat(deg)</b> | 41.455  |
| <b>NE_Lon(deg)</b> | 101.264 |
| <b>SE_Lat(deg)</b> | 6.875   |
| <b>SE_Lon(deg)</b> | 101.264 |

### Band Wise Details

|              | Res_AL(Km) | Res_AX(Km) | Image Height | Image Width |
|--------------|------------|------------|--------------|-------------|
| <b>LWIR1</b> | 10.0       | 10.0       | 320          | 384         |
| <b>LWIR2</b> | 10.0       | 10.0       | 320          | 384         |
| <b>LWIR3</b> | 10.0       | 10.0       | 320          | 384         |
| <b>LWIR4</b> | 10.0       | 10.0       | 320          | 384         |
| <b>LWIR5</b> | 10.0       | 10.0       | 320          | 384         |
| <b>LWIR6</b> | 10.0       | 10.0       | 320          | 384         |

## GDQE Computation Base

|                   |                |                                      |        |                               |            |                            |           |
|-------------------|----------------|--------------------------------------|--------|-------------------------------|------------|----------------------------|-----------|
| <b>Projection</b> | MER            | <b>Wildpoint Rejection Threshold</b> | 2.60   | <b>SemiMajorAxis(m)</b>       | 6378137.00 | <b>Mode Of Computation</b> | grid      |
| <b>Ellipsoid</b>  | WGS_84         |                                      | -sigma | <b>SemiMinorAxis(m)</b>       | 6356752.31 | <b>Used Reference Type</b> | REFINSREF |
| <b>Datum</b>      | WGS_84         | <b>Unit</b>                          | pixels | <b>Standardparallel1(deg)</b> | 17.0       |                            |           |
| <b>Zone</b>       | Not Applicable |                                      |        | <b>Standardparallel2(deg)</b> | 17.0       |                            |           |

\* -999.99 : Not Applicable/Not Available

## References

**JobId : 3DSND02MAY20170300L1BSA1**

(-999.99 - Not Available/Not Computed)

| Ref.No | Source | File Name       | Resolution ( m ) | Projection |
|--------|--------|-----------------|------------------|------------|
| 1      | ETM    | world_Band1.img | 500.0            | GGP        |

## Location Accuracy

### GCP Distribution Statistics

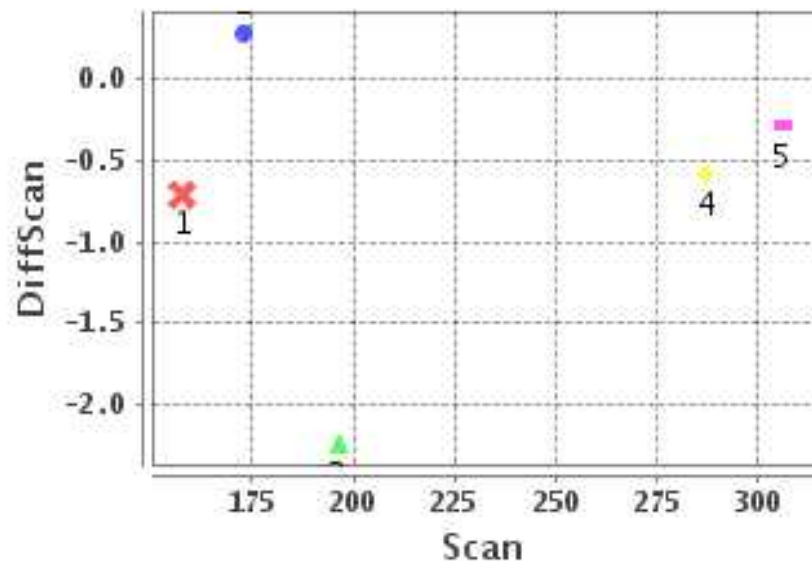
Image Width (pixels) : 384      Image Height (pixels) : 320      No of GCPs : 5

|                 | Mean  | StdDev | Min   | Max    | Coverage(in %) |
|-----------------|-------|--------|-------|--------|----------------|
| <b>GCP Scan</b> | 224.0 | 60.8   | 157.8 | 306.00 | 46.33 (N-S)    |
| <b>GCP Pix</b>  | 193.6 | 88.9   | 101.8 | 352.25 | 65.23 (E-W)    |

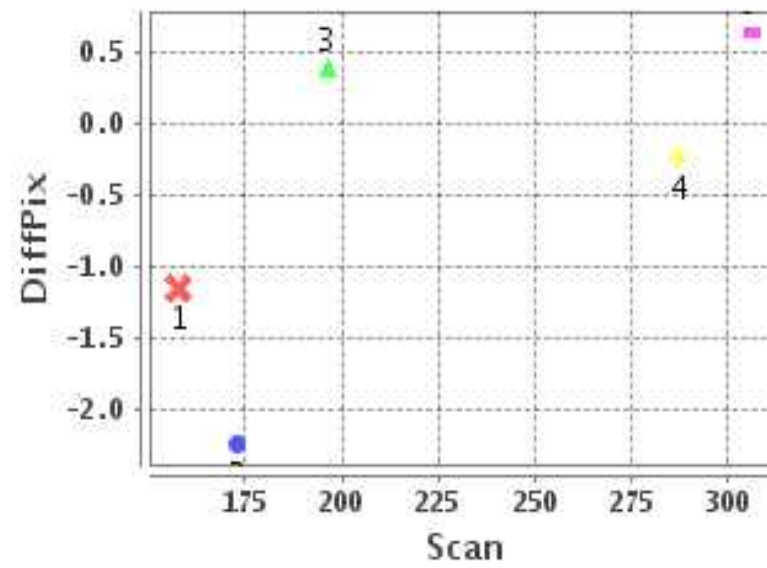
### Identified Control Point details : ( Differences are Reference - Product )

| No | Scan  | Pix   | DiffScan (line) | DiffPix (pixel) | DifLat (Km) | Dir | DifLon (Km) | Dir | Status   |
|----|-------|-------|-----------------|-----------------|-------------|-----|-------------|-----|----------|
| 1  | 157.8 | 101.8 | -0.7            | -1.16           | 0.502       | S   | 3.822       | W   | Accepted |
| 2  | 173.0 | 120.2 | 0.3             | -2.24           | 3.287       | S   | 21.622      | W   | Accepted |
| 3  | 287.2 | 212.2 | -0.6            | -0.25           | 3.180       | N   | 0.220       | E   | Accepted |
| 4  | 196.2 | 352.2 | -2.2            | 0.38            | 21.734      | N   | 7.575       | E   | Accepted |
| 5  | 306.0 | 181.2 | -0.3            | 0.63            | 2.756       | N   | 8.458       | E   | Accepted |

### Error(Pixels) Vs. GCPScan



### Error(Pixels) Vs. GCPScan



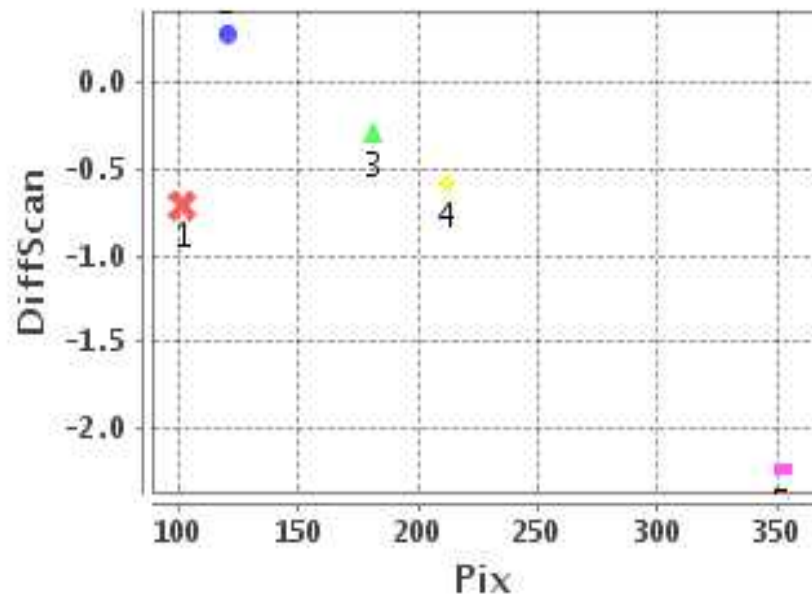
#### Number Of Points

|       |   |
|-------|---|
| North | 3 |
| South | 2 |
| East  | 3 |
| West  | 2 |

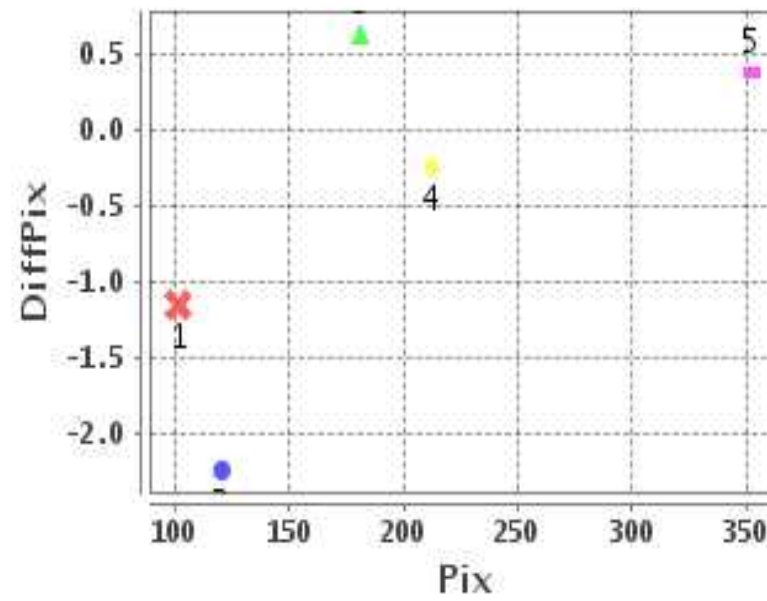
#### Radial Error ( Km )

|      |       |
|------|-------|
| Mean | 1.216 |
| Min  | .319  |
| Max  | 2.302 |
| CE90 | 2.187 |

### Error(Pixels) Vs. GCPPix



### Error(Pixels) Vs. GCPPix



#### Location Accuracy

|               | Mean   | StdDev | RMS   | Dir | * MinRMS | * MaxRMS |
|---------------|--------|--------|-------|-----|----------|----------|
| Along( Km )   | 0.478  | 0.880  | 1.001 | N   | 0.268    | 1.119    |
| Across ( Km ) | -0.184 | 1.090  | 1.105 | W   | 0.599    | 1.236    |

## Block-Wise Geo location Error Statistics

### Location Accuracy,Scale,ID

|  |         |          |
|--|---------|----------|
| <b>Scan Range-0-105; Pix Range-0-127</b> |         |          |
| Number of GCPs                           | -999    |          |
| <b>Location Error(Km)</b>                |         |          |
| Along(Mean,Dir)                          | -999.99 | NotAvail |
| Across(Mean,Dir)                         | -999.99 | NotAvail |
| <b>Scale(Km)</b>                         |         |          |
| Average Scale (Mean,%Variation)          | -999.99 | -999.9   |
| <b>Internal Distortion(Pixel)</b>        |         |          |
| Along(Mean,Stddev)                       | -999.99 | -999.99  |
| Across(Mean,Stddev)                      | -999.99 | -999.99  |

|  |         |          |
|--|---------|----------|
| <b>Scan Range-0-105; Pix Range-127-255</b> |         |          |
| Number of GCPs                             | -999    |          |
| <b>Location Error(Km)</b>                  |         |          |
| Along(Mean,Dir)                            | -999.99 | NotAvail |
| Across(Mean,Dir)                           | -999.99 | NotAvail |
| <b>Scale(Km)</b>                           |         |          |
| Average Scale (Mean,%Variation)            | -999.99 | -999.9   |
| <b>Internal Distortion(Pixel)</b>          |         |          |
| Along(Mean,Stddev)                         | -999.99 | -999.99  |
| Across(Mean,Stddev)                        | -999.99 | -999.99  |

|  |         |          |
|--|---------|----------|
| <b>Scan Range-0-105; Pix Range-255-384</b> |         |          |
| Number of GCPs                             | -999    |          |
| <b>Location Error(Km)</b>                  |         |          |
| Along(Mean,Dir)                            | -999.99 | NotAvail |
| Across(Mean,Dir)                           | -999.99 | NotAvail |
| <b>Scale(Km)</b>                           |         |          |
| Average Scale (Mean,%Variation)            | -999.99 | -999.9   |
| <b>Internal Distortion(Pixel)</b>          |         |          |
| Along(Mean,Stddev)                         | -999.99 | -999.99  |
| Across(Mean,Stddev)                        | -999.99 | -999.99  |

|  |        |       |
|--|--------|-------|
| <b>Scan Range-105-212; Pix Range-0-127</b> |        |       |
| Number of GCPs                             | 2      |       |
| <b>Location Error(Km)</b>                  |        |       |
| Along(Mean,Dir)                            | -1.895 | S     |
| Across(Mean,Dir)                           | -12.72 | W     |
| <b>Scale(Km)</b>                           |        |       |
| Average Scale (Mean,%Variation)            | 11.67  | 16.68 |
| <b>Internal Distortion(Pixel)</b>          |        |       |
| Along(Mean,Stddev)                         | -1.00  | 0.00  |
| Across(Mean,Stddev)                        | 1.08   | 0.00  |

|  |         |          |
|--|---------|----------|
| <b>Scan Range-105-212; Pix Range-127-255</b> |         |          |
| Number of GCPs                               | -999    |          |
| <b>Location Error(Km)</b>                    |         |          |
| Along(Mean,Dir)                              | -999.99 | NotAvail |
| Across(Mean,Dir)                             | -999.99 | NotAvail |
| <b>Scale(Km)</b>                             |         |          |
| Average Scale (Mean,%Variation)              | -999.99 | -999.9   |
| <b>Internal Distortion(Pixel)</b>            |         |          |
| Along(Mean,Stddev)                           | -999.99 | -999.99  |
| Across(Mean,Stddev)                          | -999.99 | -999.99  |

|  |         |         |
|--|---------|---------|
| <b>Scan Range-105-212; Pix Range-255-384</b> |         |         |
| Number of GCPs                               | 1       |         |
| <b>Location Error(Km)</b>                    |         |         |
| Along(Mean,Dir)                              | 21.73   | N       |
| Across(Mean,Dir)                             | 7.57    | E       |
| <b>Scale(Km)</b>                             |         |         |
| Average Scale (Mean,%Variation)              | -999.99 | -999.9  |
| <b>Internal Distortion(Pixel)</b>            |         |         |
| Along(Mean,Stddev)                           | -999.99 | -999.99 |
| Across(Mean,Stddev)                          | -999.99 | -999.99 |

|  |         |          |
|--|---------|----------|
| <b>Scan Range-212-320; Pix Range-0-127</b> |         |          |
| Number of GCPs                             | -999    |          |
| <b>Location Error(Km)</b>                  |         |          |
| Along(Mean,Dir)                            | -999.99 | NotAvail |
| Across(Mean,Dir)                           | -999.99 | NotAvail |
| <b>Scale(Km)</b>                           |         |          |
| Average Scale (Mean,%Variation)            | -999.99 | -999.9   |
| <b>Internal Distortion(Pixel)</b>          |         |          |
| Along(Mean,Stddev)                         | -999.99 | -999.99  |
| Across(Mean,Stddev)                        | -999.99 | -999.99  |

|  |        |      |
|--|--------|------|
| <b>Scan Range-212-320; Pix Range-105-255</b> |        |      |
| Number of GCPs                               | 2      |      |
| <b>Location Error(Km)</b>                    |        |      |
| Along(Mean,Dir)                              | 2.9675 | N    |
| Across(Mean,Dir)                             | 4.34   | E    |
| <b>Scale(Km)</b>                             |        |      |
| Average Scale (Mean,%Variation)              | 9.54   | 4.56 |
| <b>Internal Distortion(Pixel)</b>            |        |      |
| Along(Mean,Stddev)                           | -0.29  | 0.00 |
| Across(Mean,Stddev)                          | 0.88   | 0.00 |

|  |         |          |
|--|---------|----------|
| <b>Scan Range-212-320; Pix Range-255-384</b> |         |          |
| Number of GCPs                               | -999    |          |
| <b>Location Error(Km)</b>                    |         |          |
| Along(Mean,Dir)                              | -999.99 | NotAvail |
| Across(Mean,Dir)                             | -999.99 | NotAvail |
| <b>Scale(Km)</b>                             |         |          |
| Average Scale (Mean,%Variation)              | -999.99 | -999.9   |
| <b>Internal Distortion(Pixel)</b>            |         |          |
| Along(Mean,Stddev)                           | -999.99 | -999.99  |
| Across(Mean,Stddev)                          | -999.99 | -999.99  |

\*-999 : no gcp available

\* -999.99 : values are not computed