

# MAMM Final Tile Product

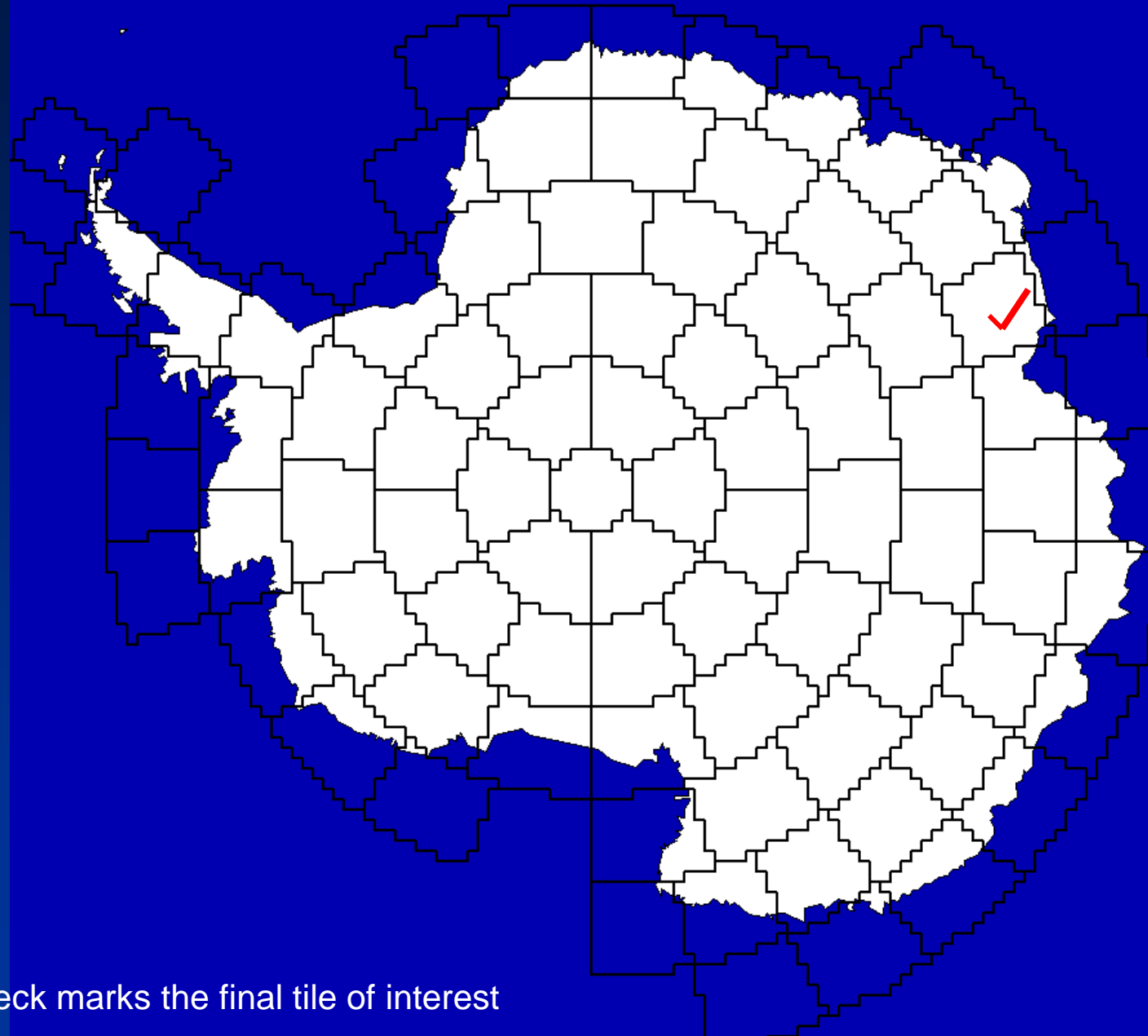
A Final Tile Product is a series of uniform 16-bit binary sub-tiles with 25 meter pixel resolution.

The Final Tile Product comprises the following

README.TXT	Comprehensive description of data and procedure
ANGLES.DIR	Incidence Angle Masks
DEMS.DIR	DEMs and DEM Index Values
DEMINDEX.DIR	DEM Index Table and Support Files
IMAGES.DIR	SAR Imagery (subtiles)
IMGINDEX.DIR	SAR Image Index Table and Support Files
INDICES.DIR	SAR Image Indices
PROGRAMS.DIR	Utility Programs
MASTER.TXT	List of all Subtiles in corresponding Tile, resolutions, and projection information

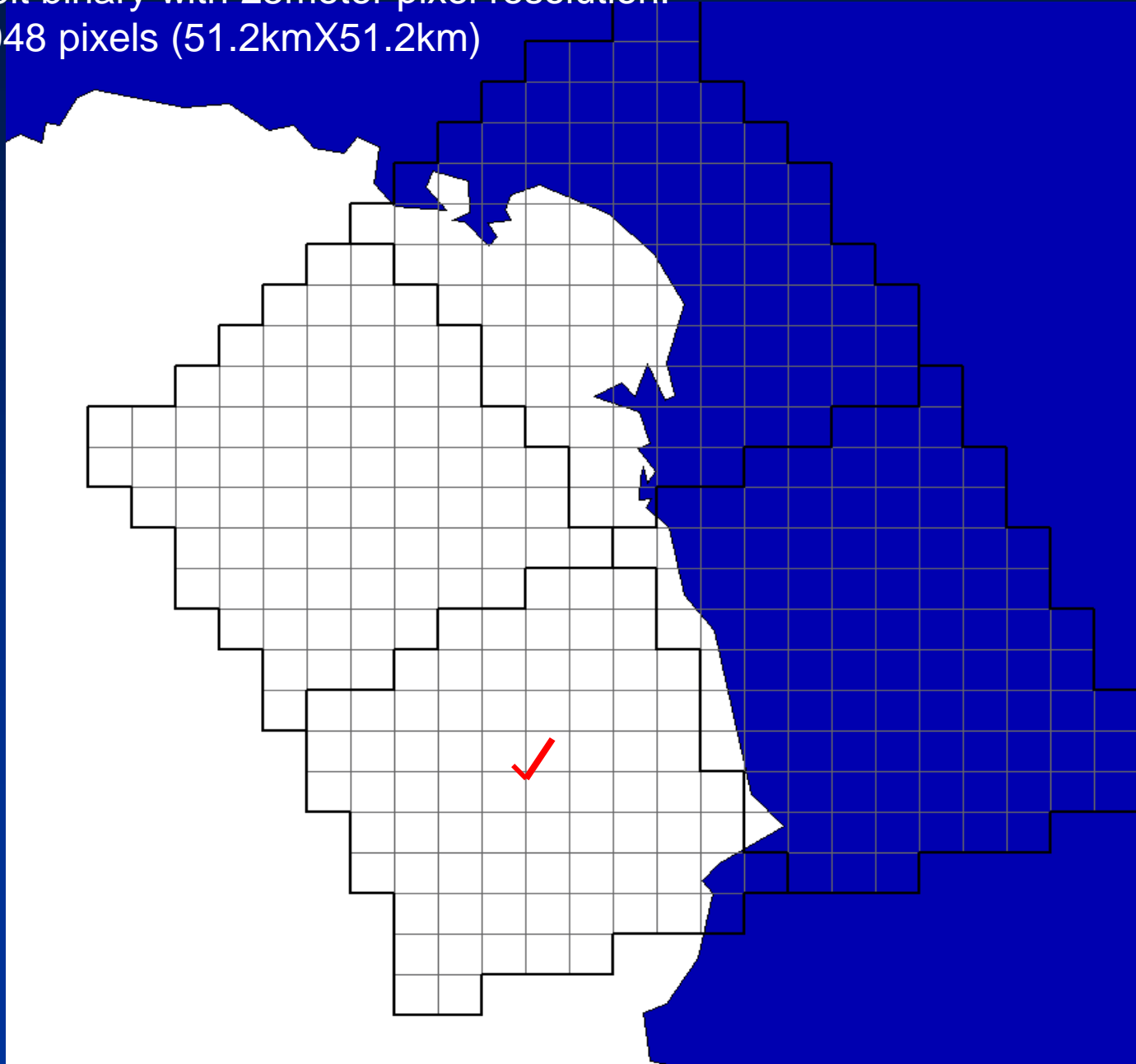
This presentation will give a review of Tiles and Subtiles followed by a brief introduction and validation of the MAMM Final Tile Product.

## Final Tile Distribution



Red check marks the final tile of interest

Each Tile is divided into X number of uniform subtiles.  
The Subtiles are 16-bit binary with 25meter pixel resolution.  
Subtiles are 2048x2048 pixels (51.2kmX51.2km)



## MAMM Final Tile # SR\_41-42: Amery Ice Shelf/Lambert Glacier Area



# MAMM FINAL TILE PRODUCT

The Final Tile Product comprises the following:

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•DEMS.DIR	DEMs and DEM Index Values
•DEMINDEX.DIR	DEM Index Table and Support Files
•IMAGES.DIR	SAR Imagery (subtiles)
•IMGINDEX.DIR	SAR Image Index Table and Support Files
•INDICES.DIR	SAR Image Indices
•PROGRAMS.DIR	Utility Programs
•MASTER.TXT	List of all Subtiles in corresponding Tile, resolutions, and projection information

# README.TXT

The README.TXT is a text file containing pertinent information regarding the final tile product.

## General Information

- Definition of terminology
- Explanation of Block and Tile Processing Steps
- Naming Conventions

## File Contents and their Use

- Brief explanation describing each of the items included with the final product
- List of C-programs provided with the final coherence products and an example on how to use them.

## Getting started

# ANGLES.DIR

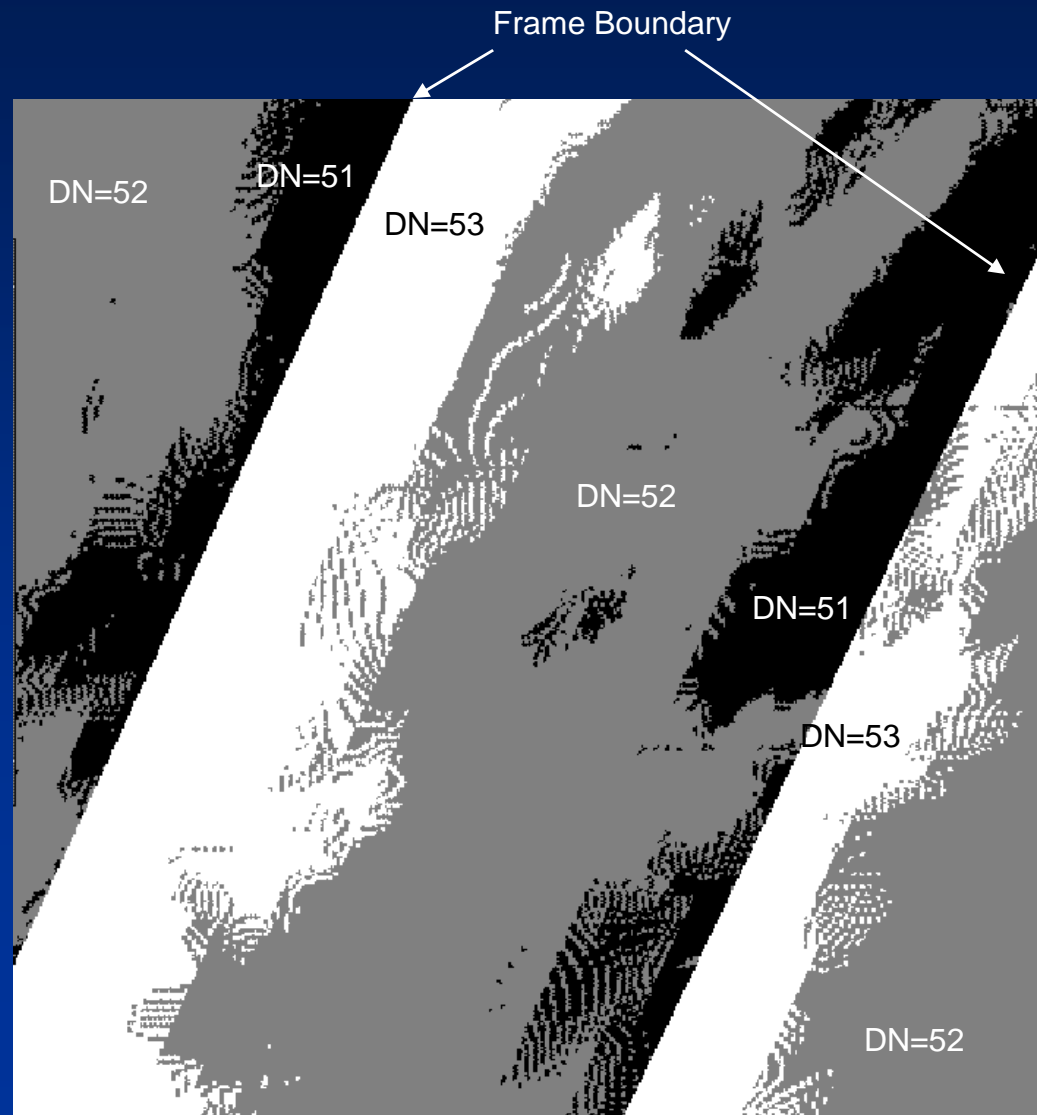
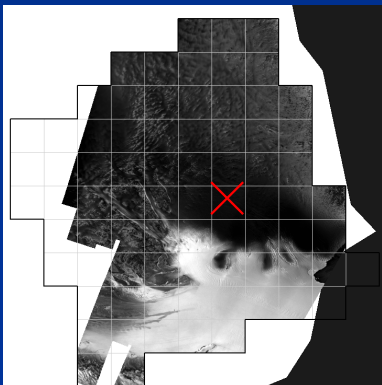
- These are shadow/layover/incidence angle sub-tiles
- 100 meter resolution
- 8-bit unsigned integer binary raster images
- Dimension 512x512 pixels

Encoded gray-scale:

- 0 : Shadow Region
- 1-253 : Incidence Angle =  $90 - \text{DN}$
- 254 : Layover Region
- 255 : No-Data

Observations:

- Ramp of DN values from near to far range within a frame
- Slight jump in DN values across frame boundaries
- Incidence angles range from 37 to 39 degrees



# ANGLES.DIR Validation

Validation was done by subtracting the DN values obtained from the raster images in the ANGLES.DIR directory (gray scale 0-255) from 90 and comparing it with the published incidence angles for Fine Beam data (FN1)

90 – DN	90-51=39
	90-52=38
	90-53=37

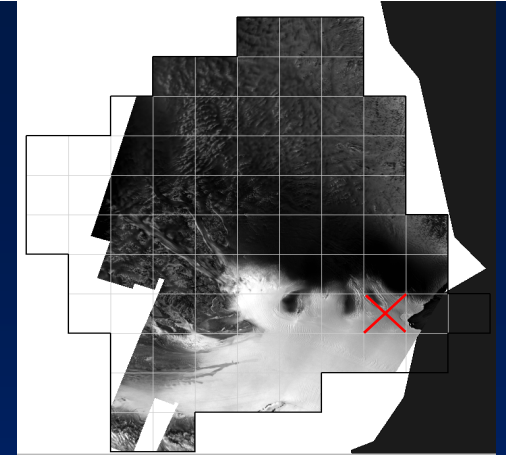
Published incidence angles for FN1 data range between 37-40 degrees

SOURCE: *RADARSAT ILLUMINATED, Your Guide to Products and Services*

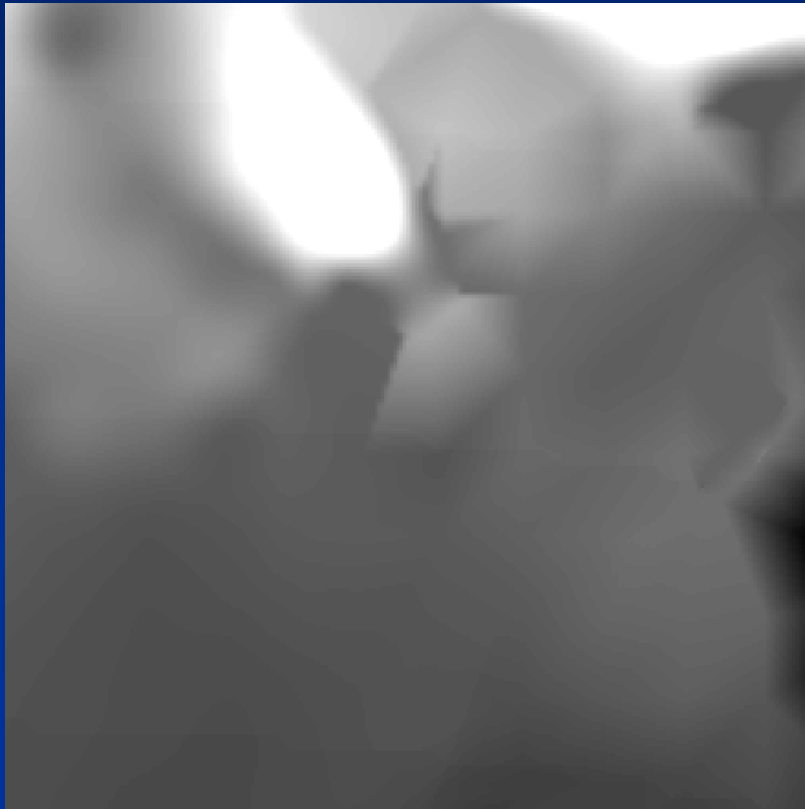


# DEM.DIR

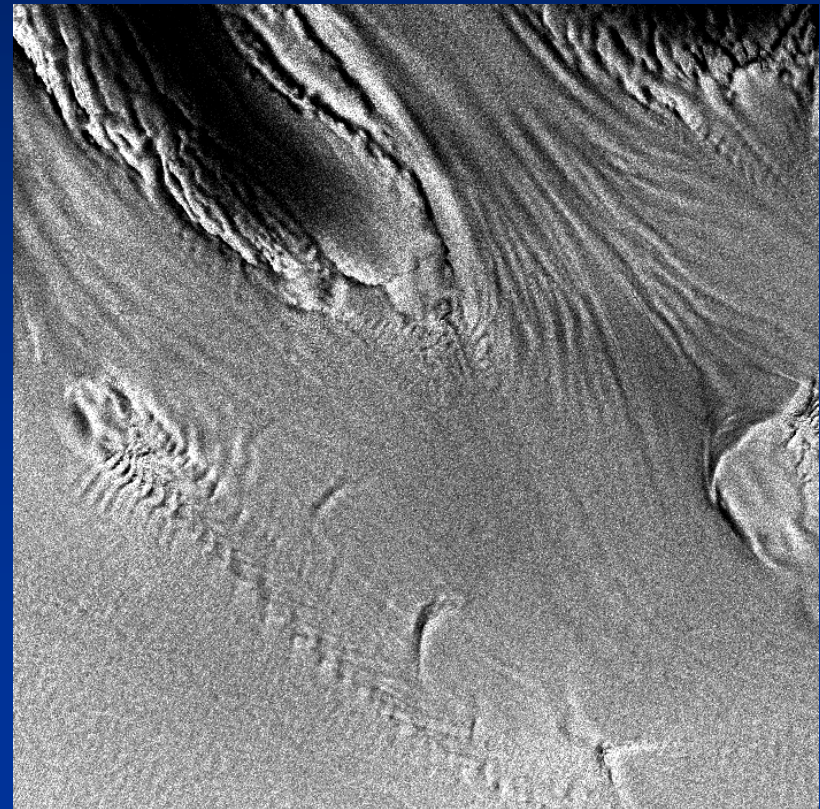
- This directory contains subtiles of the Digital Elevation Model
- 200 meter resolution
- 16-bit binary raster files
- Dimension 256x256
- Polar Stereographic projection with standard latitude of -71 degrees
- No data areas = -9999



DEM Subtile (E043T016)



Corresponding Image Subtile



## DEM.DIR Validation

Validation was done by subsetting the original DEM using the corner pint information available in the MASTER.TXT for the subtile shown on the previous slide.

The subsetting original DEM was then subtracted from the RAMS generated DEM Subtile.

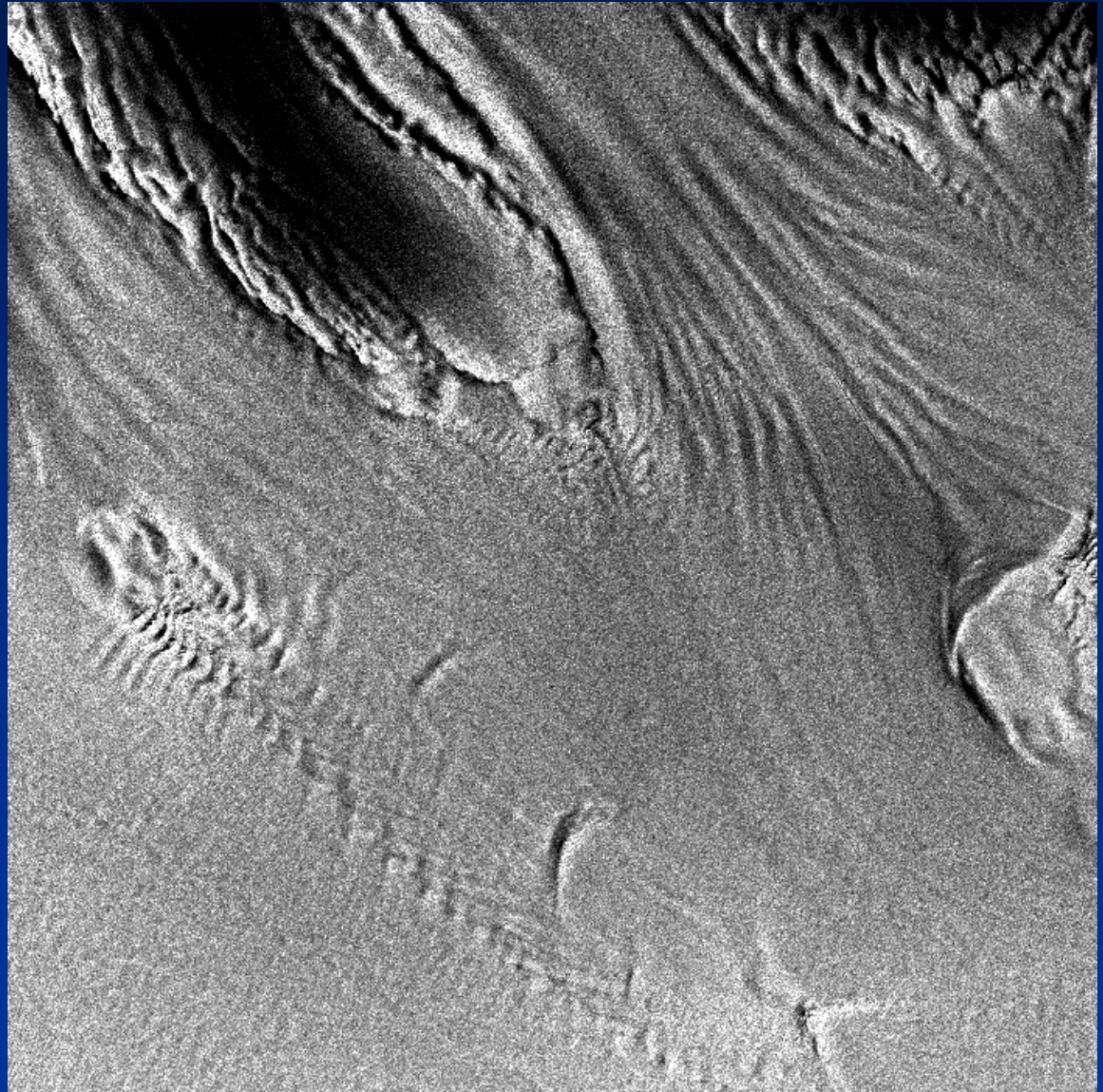
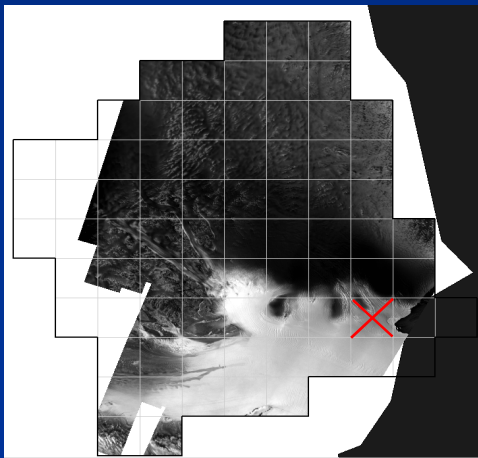
The result was all ZEROs. Thus validating that the RAMS generated DEM subtiles was an exact match of the original DEM.



# IMAGES.DIR

- This directory contains subtiles of the SAR imagery
- Tiles can contain up to 98 subtiles
- 25 meter resolution
- 16-bit binary raster files
- Dimension 2048x2048
- No data areas = -9999

E043T016



# IMAGES.DIR Validation

Our first validation was applied to the orthorectified images (individual frames that went into the creation of the Final Tile Product) and comprised the following three criteria.

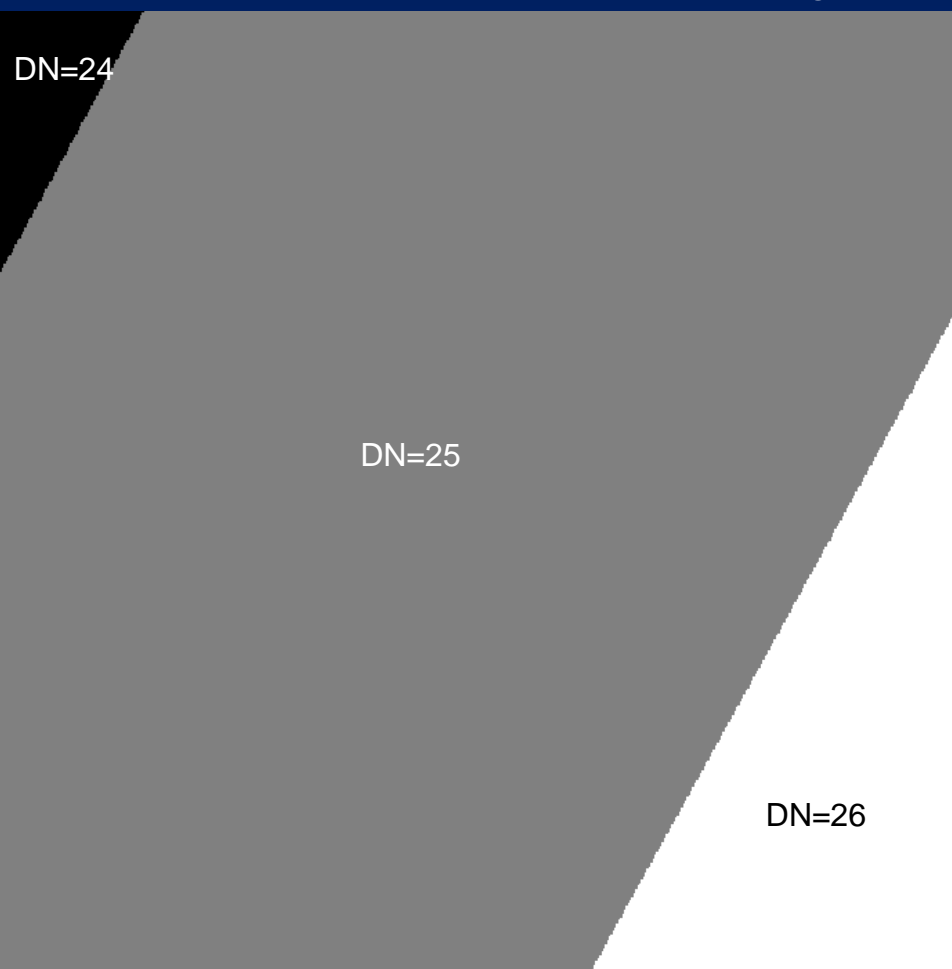
- 1) Validate locations of GCPs used in block adjustment with the orthorectified images.
- 2) Check the accuracy of the AMM-1 derived coastline with the coastline of the MAMM orthorectified imagery.
- 3) Compare like features (stable features like rock outcrop) between the AMM-1 Final Tiles and the MAMM orthorectified imagery.

# INDICES.DIR

- This directory contains the index sub-tiles
- 100 meter resolution
- 8-bit unsigned integer binary raster images
- Dimension 512x512
- Encoded gray scale:
  - DN # corresponds to an index number found in the IMGINDEX.DIR/INDEX.TBL file
  - Each Index # corresponds to the Block, Orbit, and Frame that went into creating that portion of the subtile.

## Excerpt from INDEX.TBL

23	"Block 1 Orbit 25912 Frame 3 R_SAT"
24	"Block 1 Orbit 25726 Frame 4 R_SAT"
25	"Block 1 Orbit 25826 Frame 12 R_SAT"
26	"Block 1 Orbit 25583 Frame 7 R_SAT"

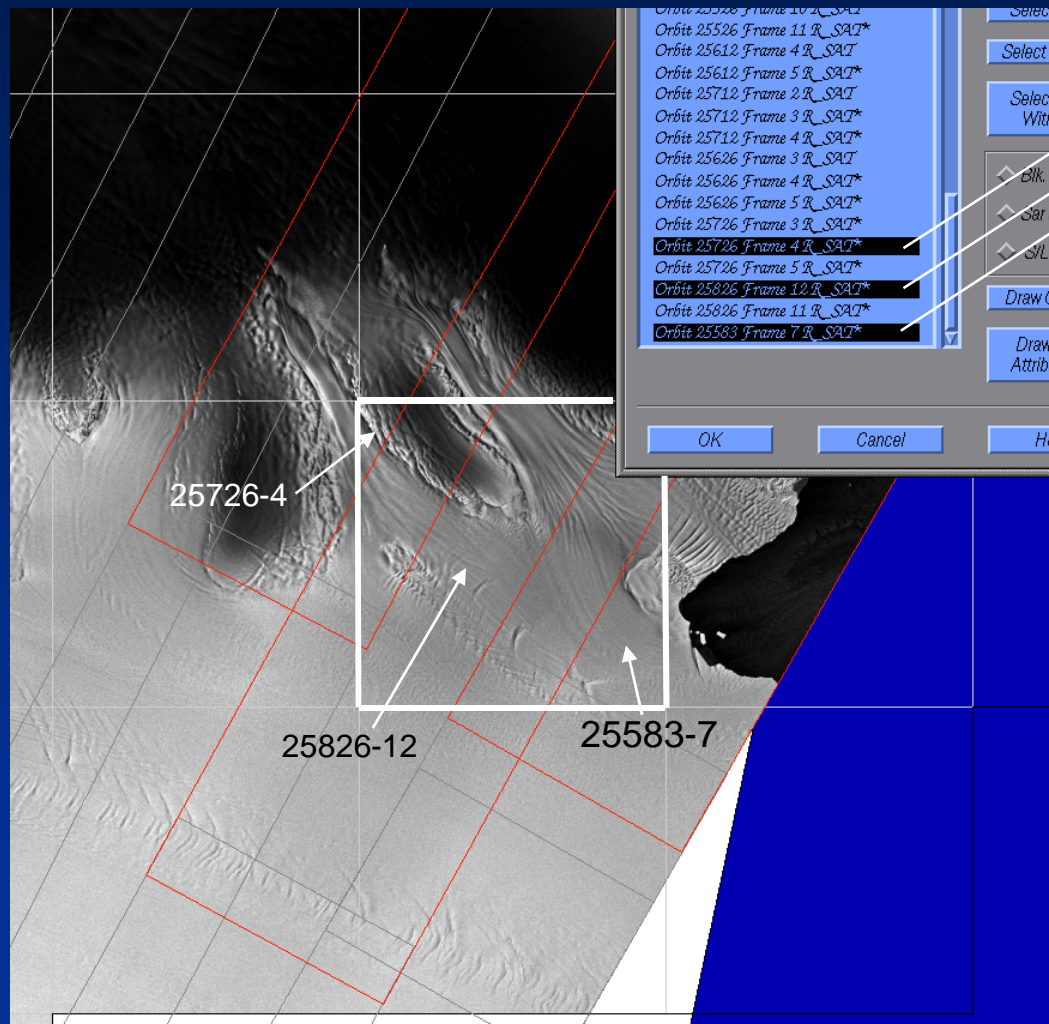


E043T016



# INDICES.DIR Validation

Validation was done by using the information gleaned from the INDEX.TBL and the information contained in the MAMM database.



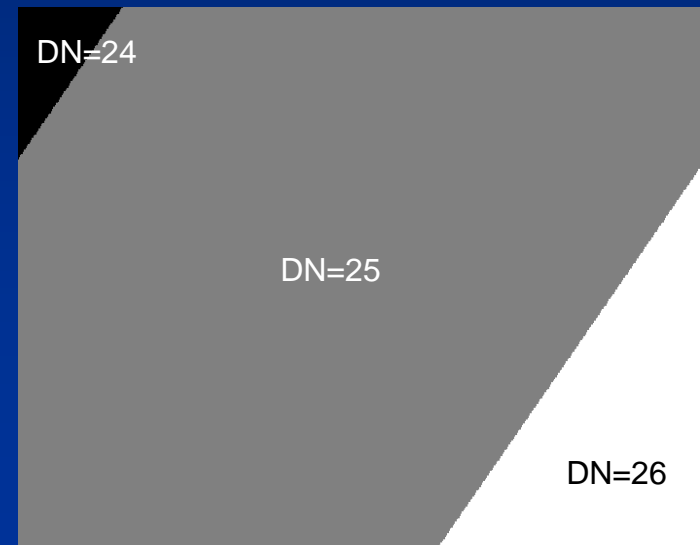
Orbit 25726 frame 4 (index #24)

Orbit 25826 frame 12 (index #25)

Orbit 25583 frame 7 (index#26)

## INDEX.TBL

24	"Block 1 Orbit 25726 Frame 4 R_SAT"
25	"Block 1 Orbit 25826 Frame 12 R_SAT"
26	"Block 1 Orbit 25583 Frame 7 R_SAT"



E043T016

# PROGRAMS.DIR

The following C-programs are supplied with the Final Tile Product

**GEO2MAP** – Converts latitude and longitude to x, y map coordinates

GEO2MAP -68.891640 70.022382  
2179199.975, 792200.007

**MAP2GEO** – Converts x, y map coordinates to latitude and longitude

MAP2GEO 2179200 792200  
-68.891640, 70.022382

**TILE2MAP** – Converts RAMS tile name, column (line), and row (sample) to map x, y coordinates.

TILE2MAP E043T016 -l 200 -s 200  
map (x, y) = (2155375.0, 814225.0)

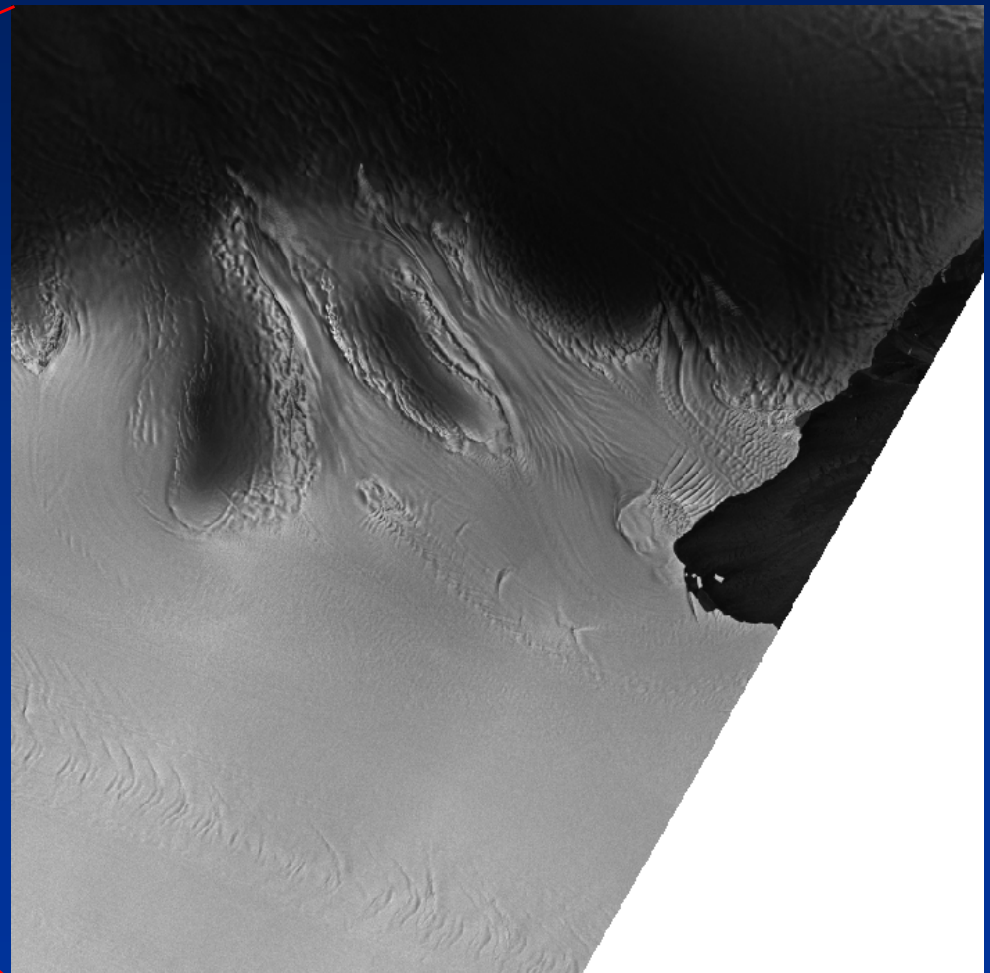
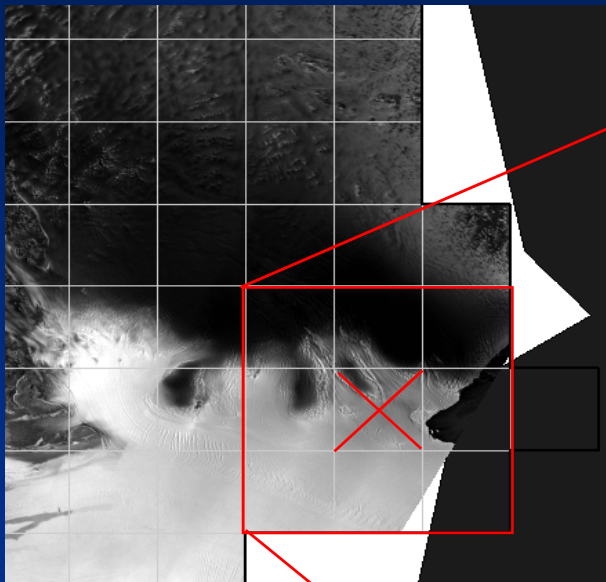
**MAP2TILE** – Converts map x, y coordinates to RAMS tile name, column (line), and row (sample).

MAP2TILE 2155375 814225  
E043T016 LINE: 200, SAMPLE: 200

**MERGEMAP** – Generates a composite image for all subtiles within an area specified by a center point and size (meters).

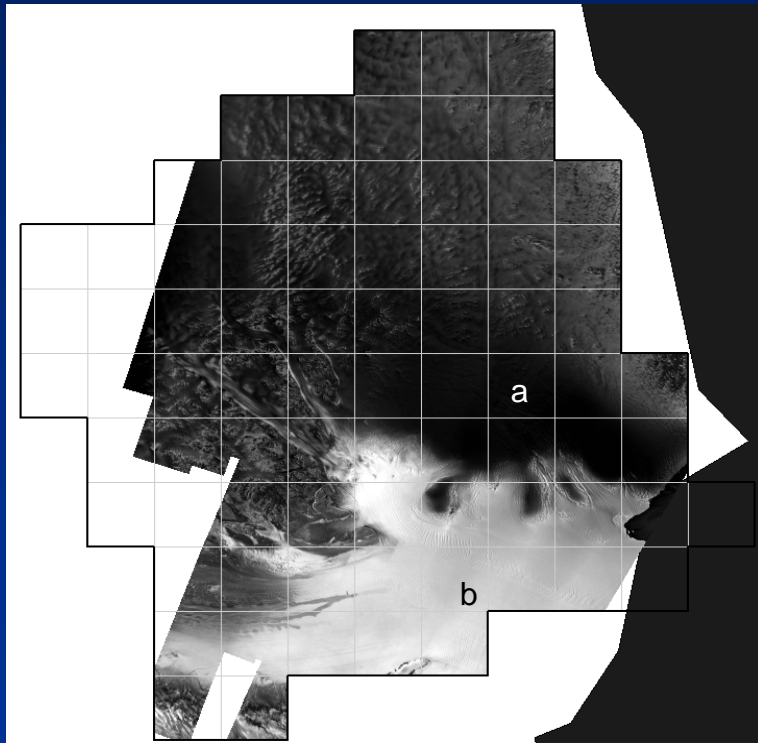
```
MERGEMAP -l -68.891, 70.022 -size 60000 60000 -path ./ -fout FILE.OUT -hdr
```

Validation was done by picking a latitude/longitude in the middle of a known subtile (X) (E043T016) and generating a composite image with all the subtiles in a 60km radius of that point (which should be all the surrounding subtiles).





**GETSIGMA0** – Generates the 'original' pixel value in dB at image location x, y in map coordinates.

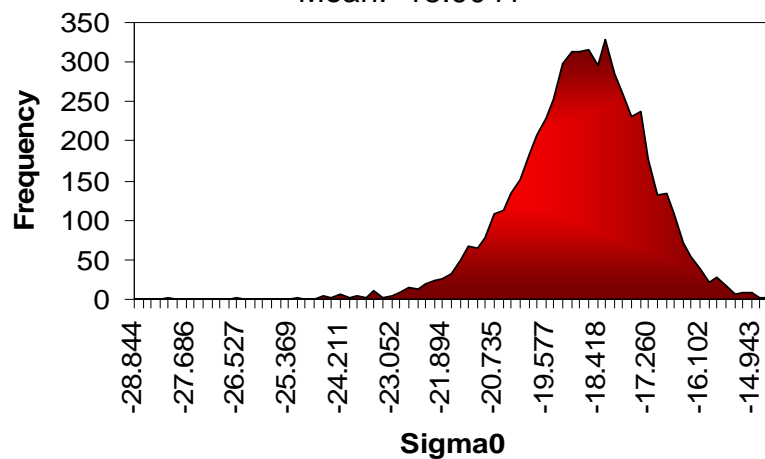


Validation was done by comparing Sigma0 values derived from the MAMM Final Tile Product (Fine Beam) with Sigma0 values derived from the AMM-1 Final Tile Product (Standard Beam) for a very dark area (A) and a very bright area (B).

See histograms on next slide

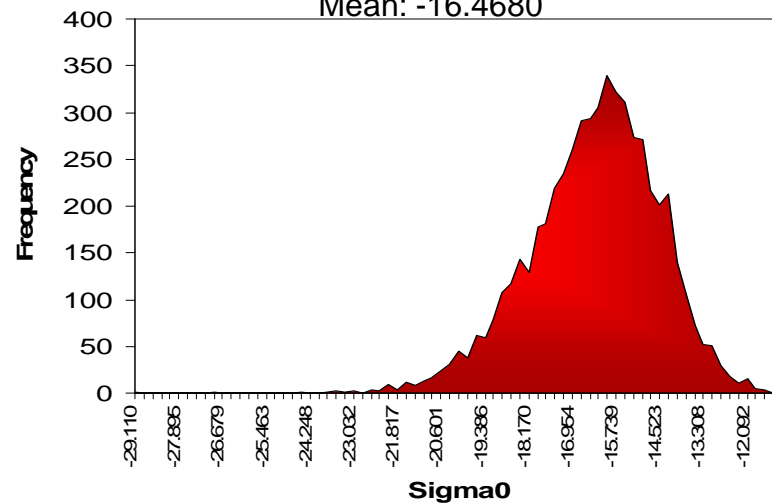
**MAMM derived Sigma0 (dB)  
dark area A**

Mean: -18.9041



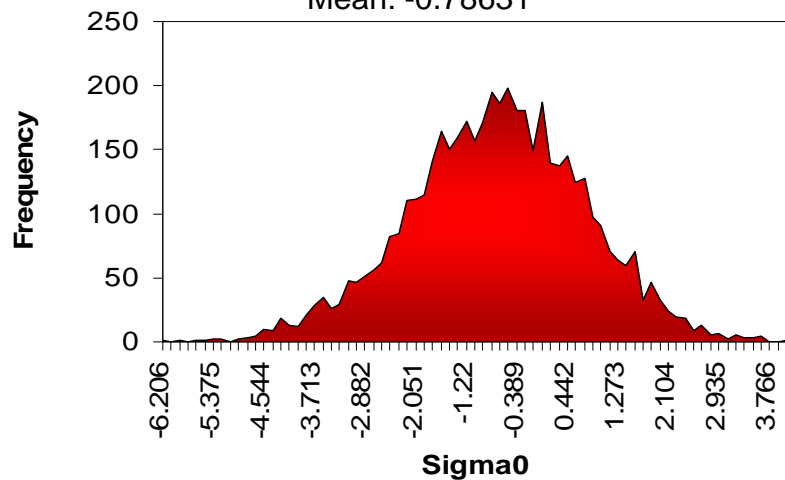
**AMM-1 derived Sigma0 (dB)  
Dark Area A**

Mean: -16.4680



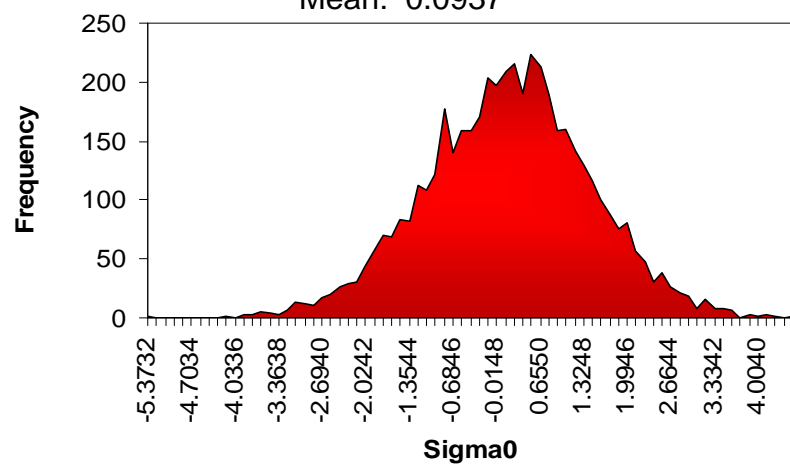
**MAMM derived Sigma0 (db)  
Bright Area B**

Mean: -0.78631



**AMM-1 derived Sigma0 (dbB)  
Bright Area B**

Mean: 0.0937



# NOTE ON AMM-1 GETSIGMA0

