

Tutorial on SAR, InSAR, PSInSAR

SARPROZ

The SAR processing tool by Periz

http://ihome.cuhk.edu.hk/~b122066/index_files/download.htm

Part V

Petronas University of Technology UTP

Small area processing (II)

PSInSAR Analysis in Small Area processing

Sparse Points Multi-Image InSAR Analysis

Reference Point
Parameter: Coher: 0.91333
 Manual Selection APS:

PS Processing

	Estimate	Read	Neglect	Parameters range	
Linear Trend	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	-100	100
Height	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	-100	100
Az. Pos.	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>		
Phase Gap	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	-pi	pi
Seasonal trend	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	-4	4

Ext. DEM Weights Nmin Iter.
Scattering centers Polynomial order
Matr. Coher. Win Amps processing Go Ask Skip

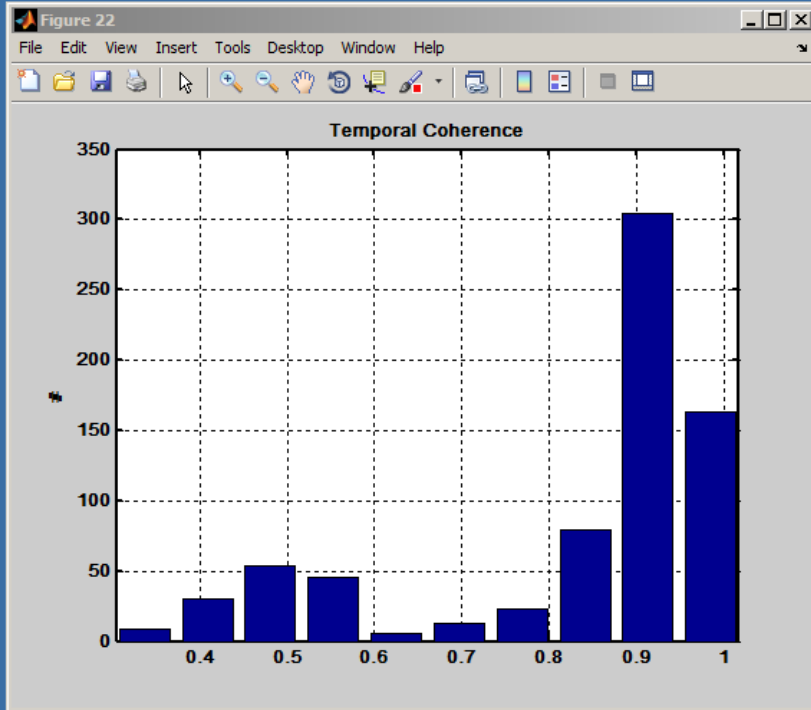
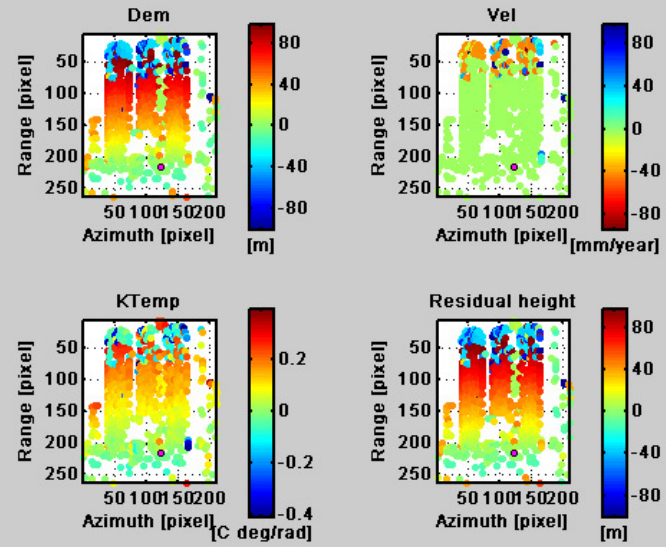
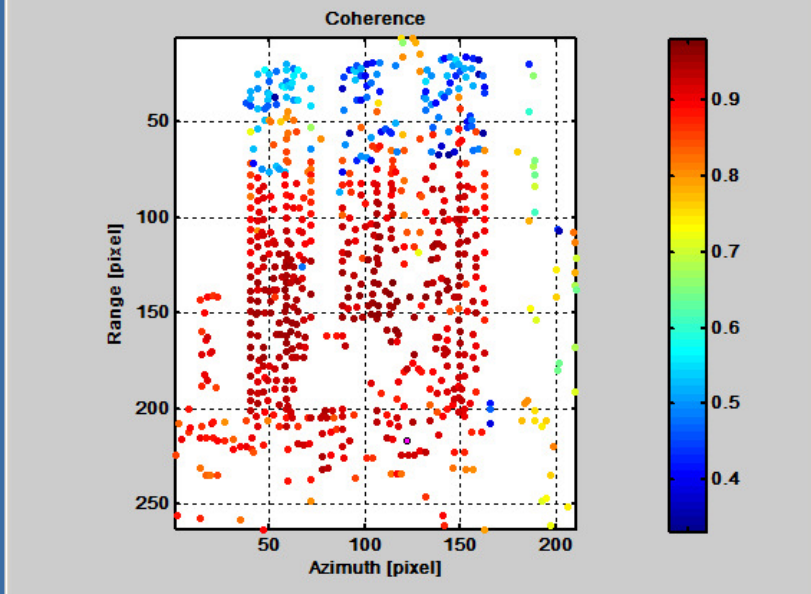
Phase series processing

Go Show Results Phase Series Write Results OK

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Estimating also the seasonal trend

PSInSAR Analysis in Small Area processing



PSInSAR Analysis in Small Area processing

Different range of parameters to estimate

Sparse Points Multi-Image InSAR Analysis

Reference Point
Parameter: Refl. map Coher: 0.91333
 Manual Selection Go APS: none

PS Processing

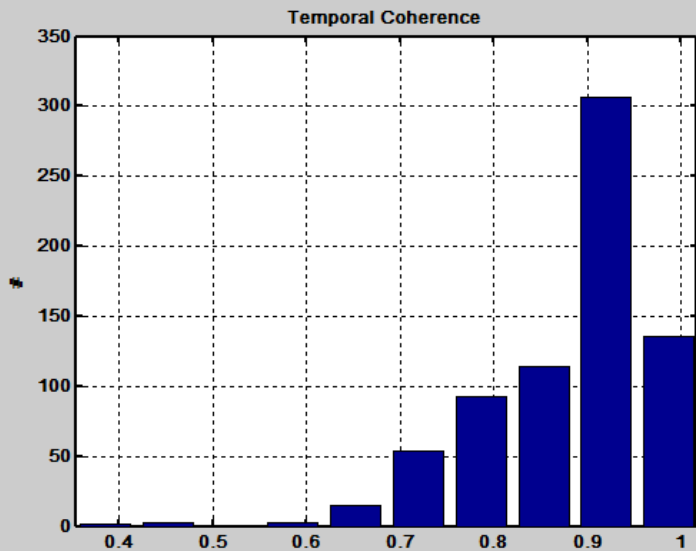
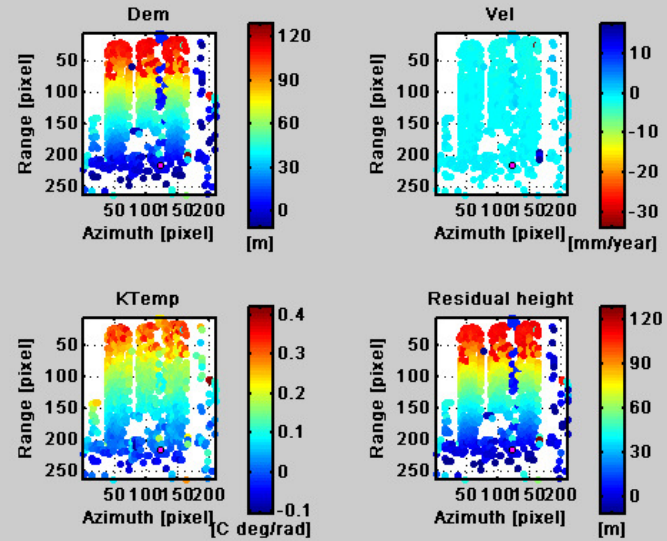
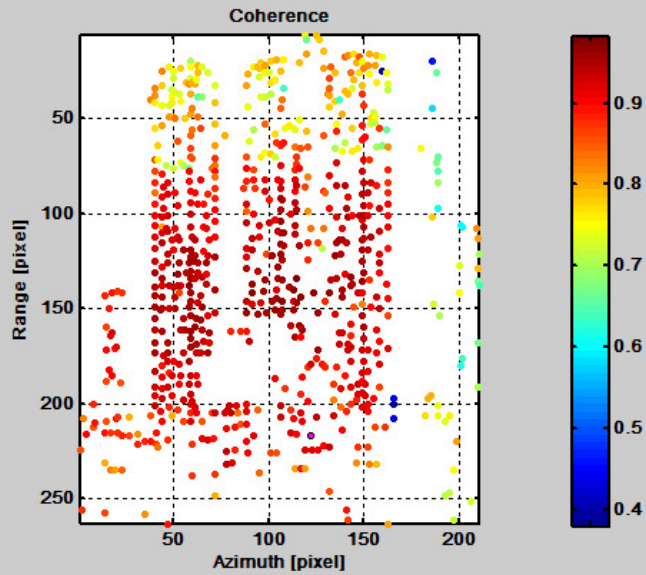
	Estimate	Read	Neglect	Parameters range	
Linear Trend	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	-50	20
Height	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	-20	150
Az. Pos.	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	-1	1
Phase Gap	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	-pi	pi
Seasonal trend	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	-1	.5

Ext. DEM Weights Nmin iter.: 50
Scattering centers: 1 Polynomial order: 1
Matr. Coher. Win: 15 15 Amps processing: Go Ask Skip

Visualization: Samples (50-250) vs Lines (50-200). Color bar: 0 to 3. Buttons: Go, Show Results, Phase Series, Write Results, OK.

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PSInSAR Analysis in Small Area processing



Geocoding in Small Area processing

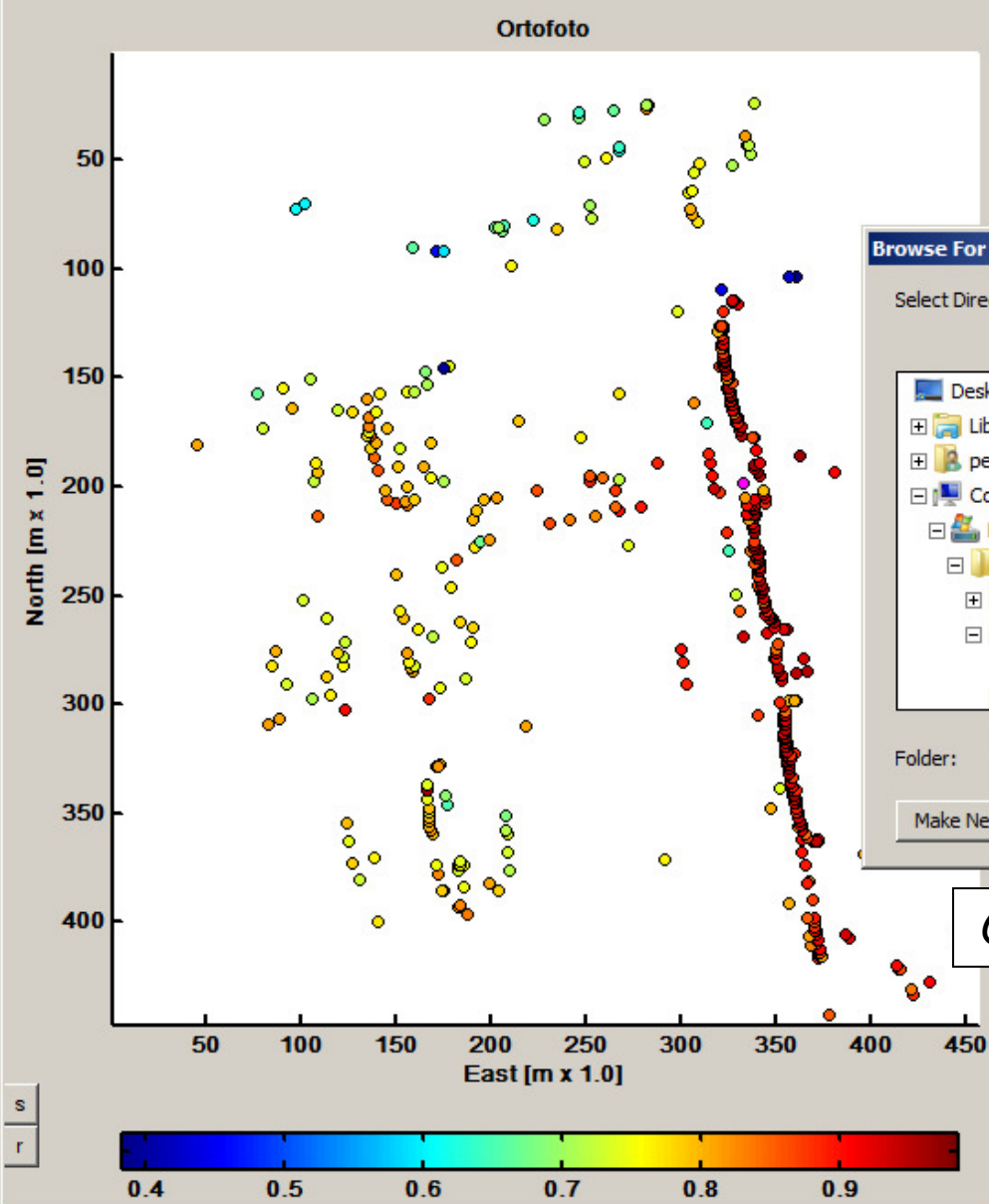
The screenshot displays the SARPROZ software interface. On the left, the 'SMALL AREA PROCESSING' window has a 'Geocoding' button highlighted with a red oval. The main window, titled 'GEOCODING - C:\1SAR\KOWLOON_TSX/', shows an 'Ortofoto' plot with a color scale from 0.4 to 0.9. A 'Parameter' list on the right includes options like Coherence, Height, Def. trend, ERS-Envi ph.sh., Azimuth position, RCS, Range width, Range pointing, Azimuth width, Azimuth pointing, Ton, Toff, Fitting index, Pos. dev., AP ampl. rel., AP phase, Temp-phase, Res. height, Temp-ampl, and PS type. A 'Mouse Click on Plotted Data...' dialog box is open at the bottom right.

Results Geocoding

Choose the parameter to display

Geocoding in Small Area processing

GEOCODING - C:\15A



UTM

View number

Load new orbit

Print

Shift q rif

View new orbit

Layer

N°

Browse For Folder

Select Directory to Open

- Desktop
- Libraries
- periz
- Computer
- Local Disk (C:)
 - 1SAR
 - CUHK_TerraSAR
 - GIS
 - HONGKONG**
 - HKDEM

Folder: HONGKONG

Make New Folder

OK

Cancel

Choose an Optical Layer

s Saturate

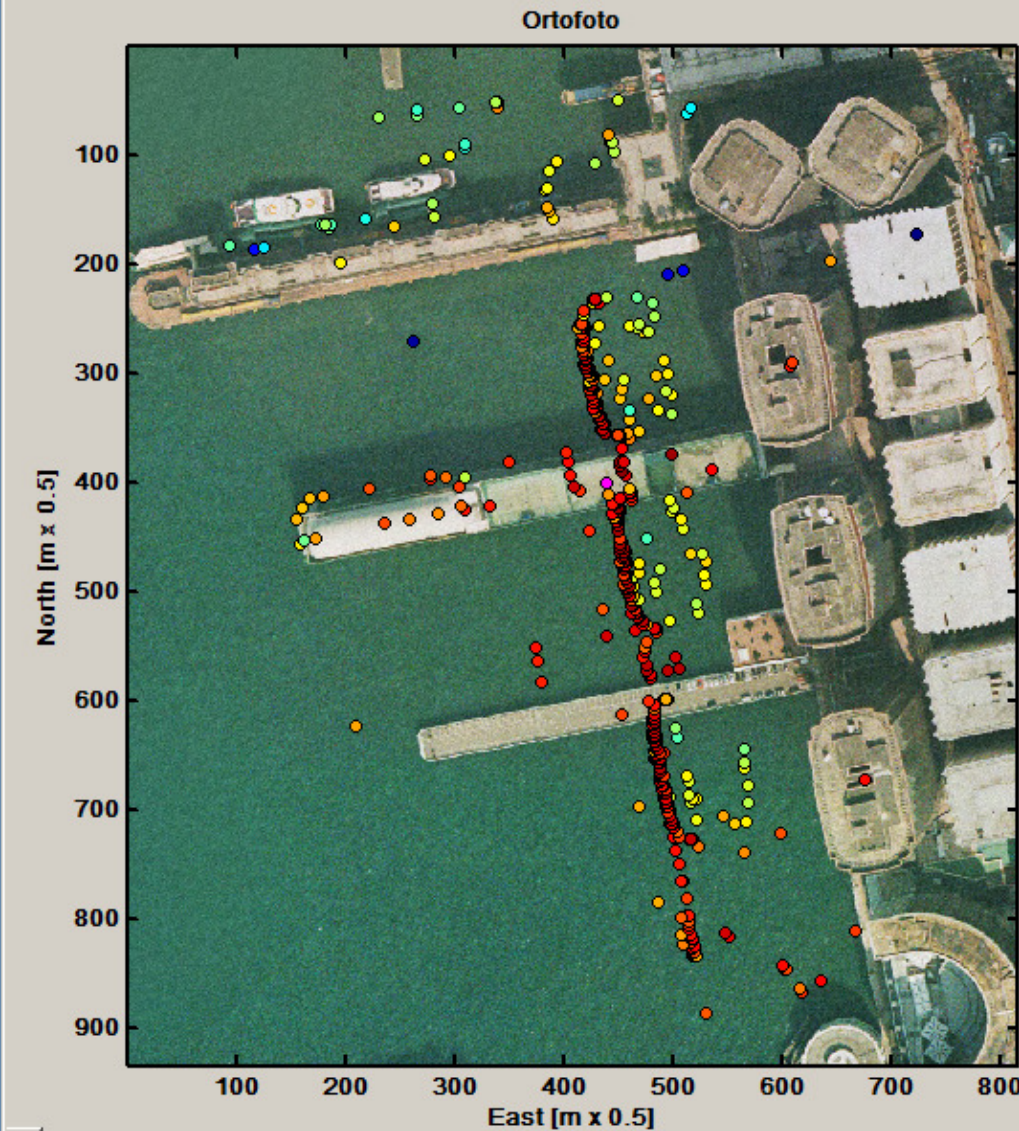
r Reset

OK

Mouse Click on Plotted Data...

SARPROZ © 20

Geocoding in Small Area processing



UTM

View number

Shift q rif

View lines

Load new orbit

View new orbit

Reflectivity map

Print

Layer

N°

Parameter

- Coherence
- Height
- Def. trend
- ERS-Envi ph.sh.
- Azimuth position
- RCS
- Range width
- Range pointing
- Azimuth width
- Azimuth pointing
- Ton
- Toff
- Fitting index
- Pos. dev.
- AP ampl. rel.
- AP phase
- Temp-phase
- Res. height
- Temp-ampl
- PS type

3D

0

Replica

Data series

Mov

Temp

s Saturate

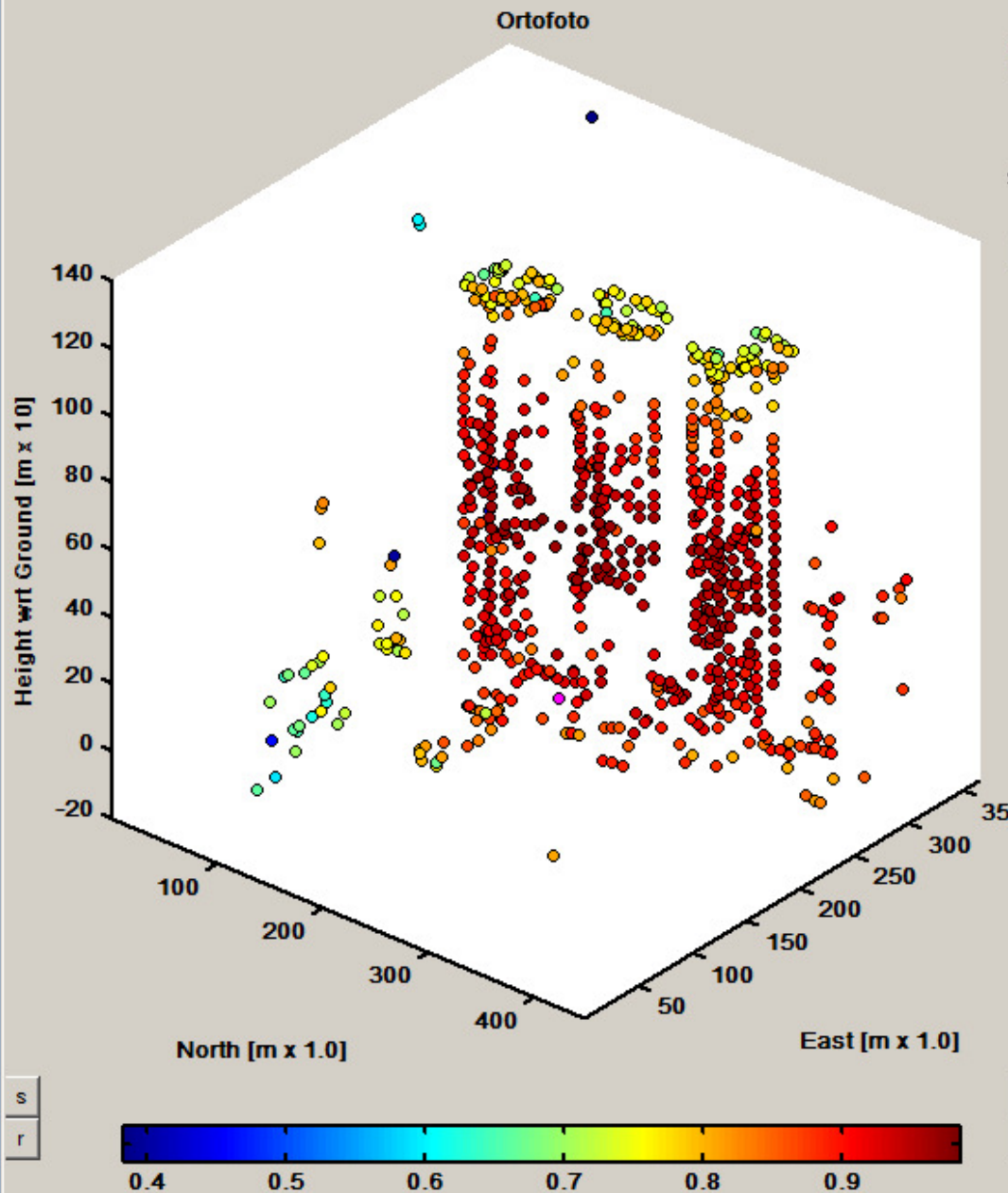
r Reset

OK

Mouse Click on Plotted Data...

0.4 0.5 0.6 0.7 0.8 0.9

Geocoding in Small Area processing



UTM

View number

Load new orbit

Print

Shift q rif

View new orbit

Layer

View lines

Reflectivity map

N°

Parameter

- Coherence
- Height
- Def. trend
- ERS-Envi ph.sh.
- Azimuth position
- RCS
- Range width
- Range position

- Ton
- Toff
- Fitting index
- Pos. dev.
- AP ampl. rel.
- AP phase
- Temp-phase
- Res. height
- Temp-ampl
- PS type

3D visualization

3D

0 Replica

Data series

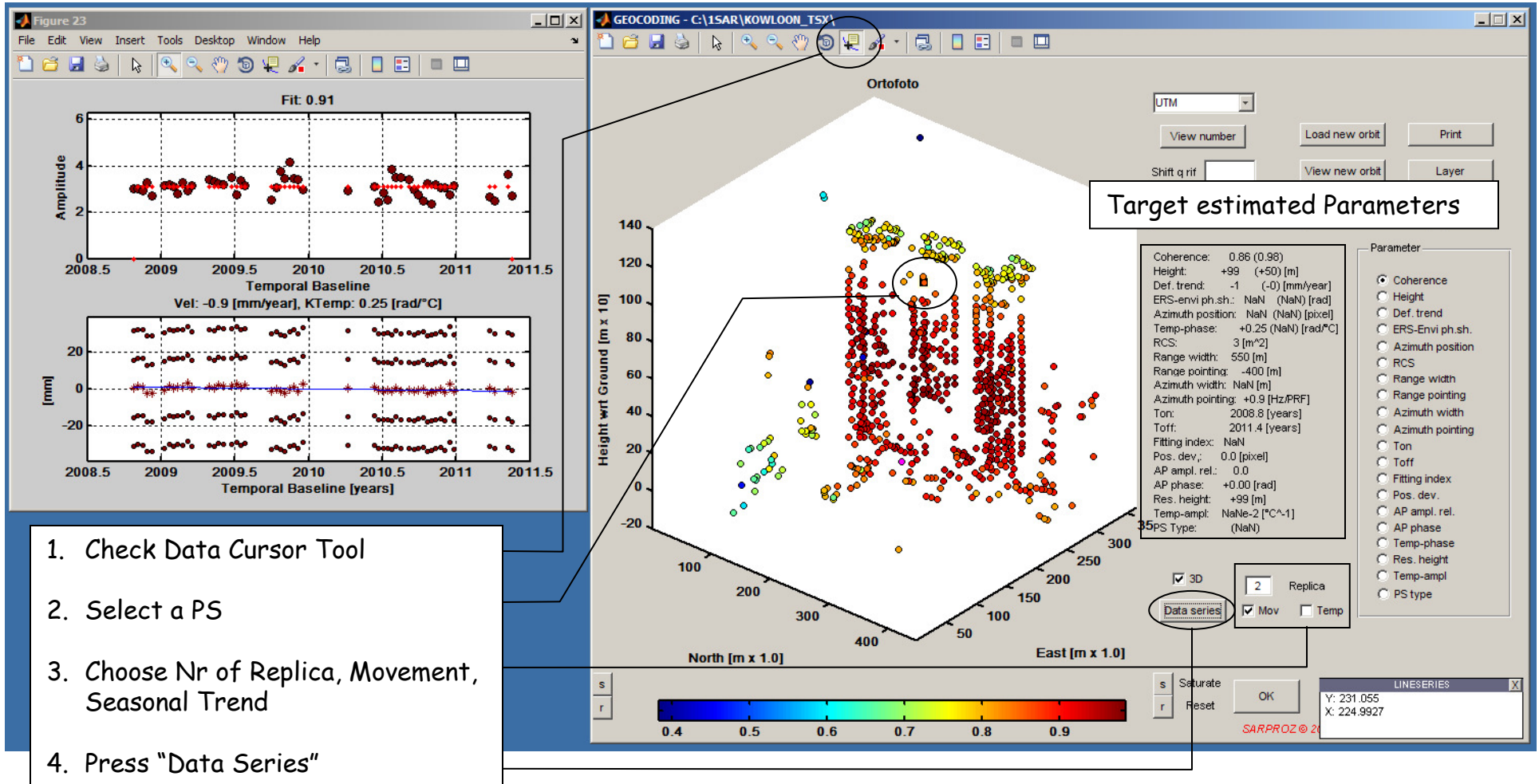
Mov Temp

s Saturate

r Reset

OK

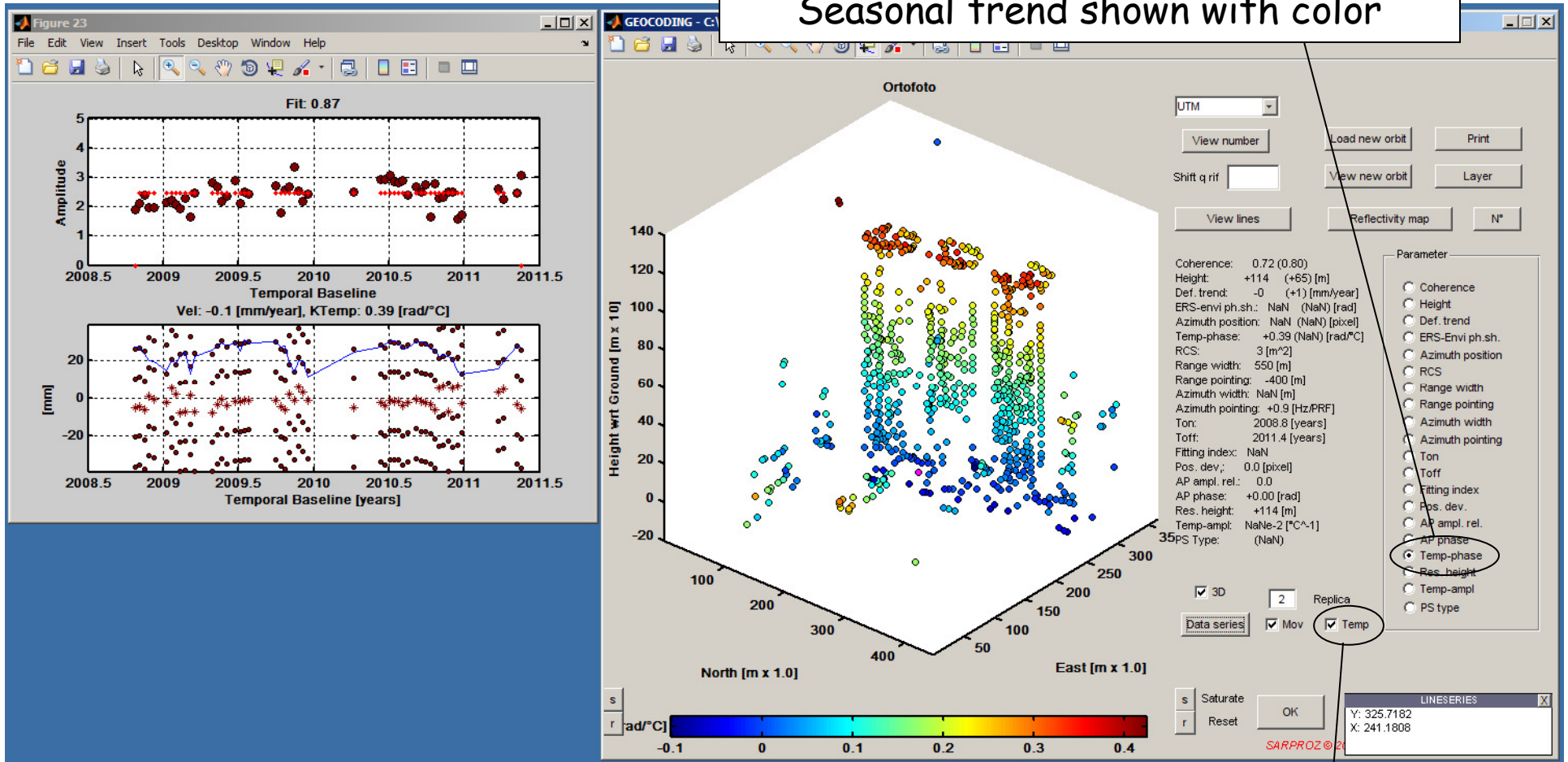
Geocoding in Small Area processing



1. Check Data Cursor Tool
2. Select a PS
3. Choose Nr of Replica, Movement, Seasonal Trend
4. Press "Data Series"

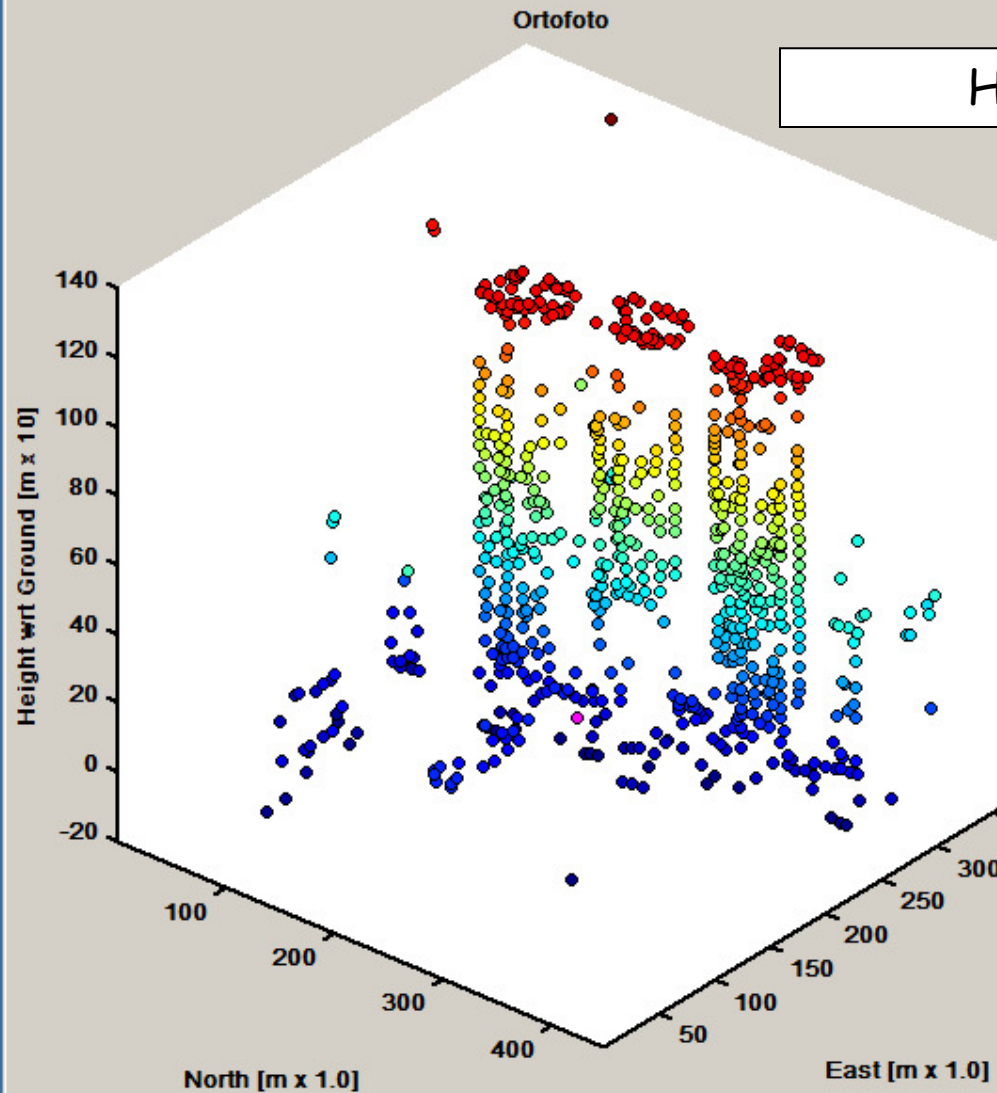
Geocoding in Small Area processing

Seasonal trend shown with color



Seasonal trend included in time series

Geocoding in Small Area processing



Height shown with color

Shift q rif

View new orbit

Layer

View lines

Reflectivity map

N°

Coherence: 0.72 (0.80)
Height: +114 (+65) [m]
Def. trend: -0 (+1) [mm/year]
ERS-envi ph.sh.: NaN (NaN) [rad]
Azimuth position: NaN (NaN) [pixel]
Temp-phase: +0.39 (NaN) [rad/°C]
RCS: 3 [m²]
Range width: 550 [m]
Range pointing: -400 [m]
Azimuth width: NaN [m]
Azimuth pointing: +0.9 [Hz/PRF]
Ton: 2008.8 [years]
Toff: 2011.4 [years]
Fitting index: NaN
Pos. dev.: 0.0 [pixel]
AP ampl. rel.: 0.0
AP phase: +0.00 [rad]
Res. height: +114 [m]
Temp-ampl: NaNe-2 [°C⁻¹]
PS Type: (NaN)

Parameter

- Coherence
- Height
- Def. trend
- ERS-Envi ph.sh.
- Azimuth position
- RCS
- Range width
- Range pointing
- Azimuth width
- Azimuth pointing
- Ton
- Toff
- Fitting index
- Pos. dev.
- AP ampl. rel.
- AP phase
- Temp-phase
- Res. height
- Temp-ampl
- PS type

3D

2

Replica

Data series

Mov

Temp

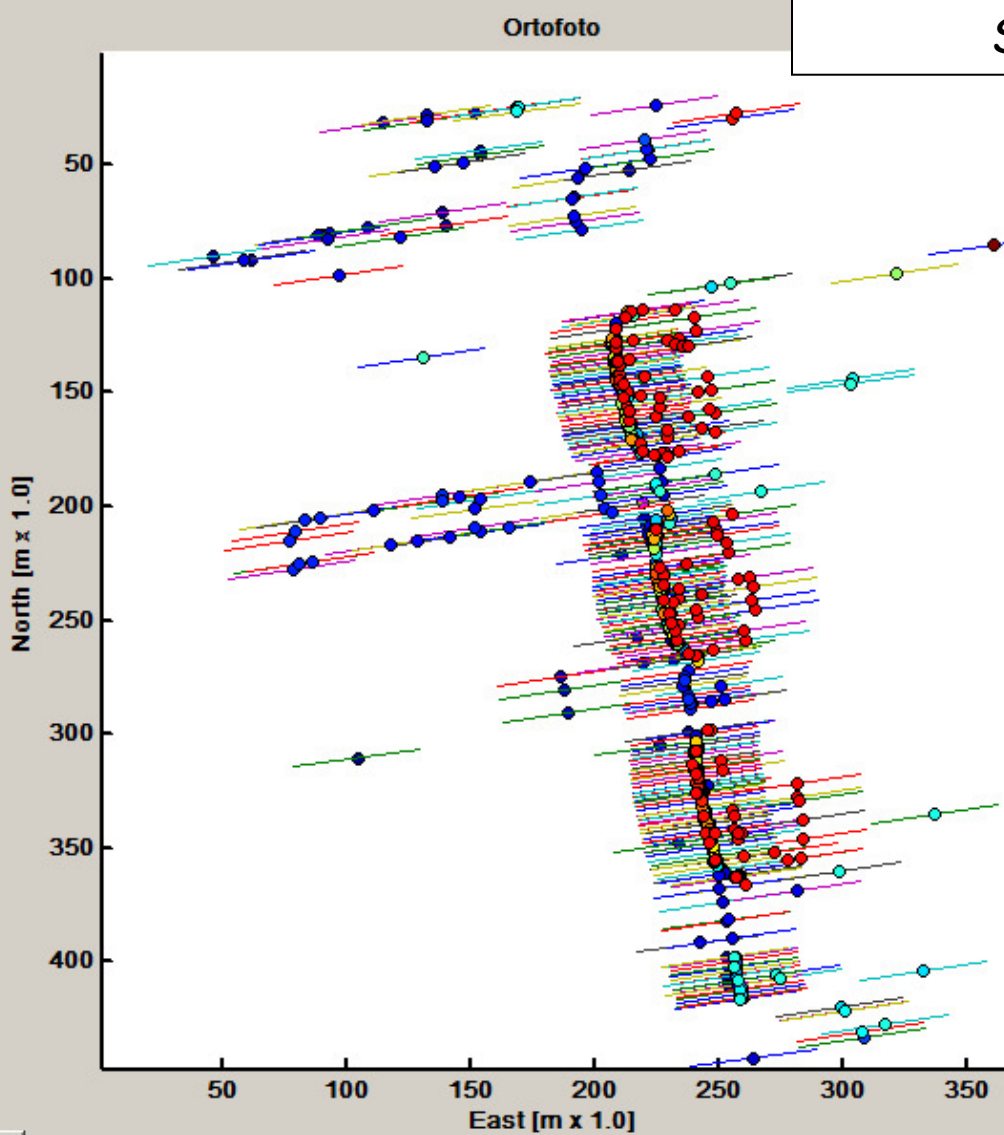
Saturate

Reset

OK

Mouse Click on Plotted Data...

Geocoding in Small Area processing



Satellite Line Of Sight

View number

Shift q rif

View lines

Load new orbit Print

View new orbit Layer

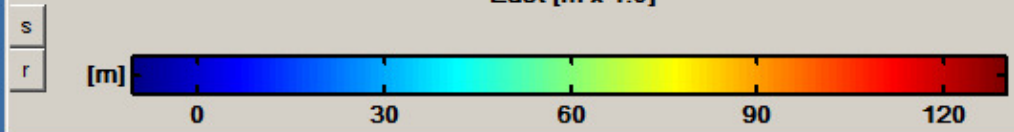
Reflectivity map N°

Coherence: 0.72 (0.80)
 Height: +114 (+65) [m]
 Def. trend: -0 (+1) [mm/year]
 ERS-envi ph.sh.: NaN (NaN) [rad]
 Azimuth position: NaN (NaN) [pixel]
 Temp-phase: +0.39 (NaN) [rad/°C]
 RCS: 3 [m²]
 Range width: 550 [m]
 Range pointing: -400 [m]
 Azimuth width: NaN [m]
 Azimuth pointing: +0.9 [Hz/PRF]
 Ton: 2008.8 [years]
 Toff: 2011.4 [years]
 Fitting index: NaN
 Pos. dev.: 0.0 [pixel]
 AP ampl. rel.: 0.0
 AP phase: +0.00 [rad]
 Res. height: +114 [m]
 Temp-ampl: NaN-2 [°C⁻¹]
 PS Type: (NaN)

- Parameter
- Coherence
 - Height
 - Def. trend
 - ERS-Envi ph.sh.
 - Azimuth position
 - RCS
 - Range width
 - Range pointing
 - Azimuth width
 - Azimuth pointing
 - Ton
 - Toff
 - Fitting index
 - Pos. dev.
 - AP ampl. rel.
 - AP phase
 - Temp-phase
 - Res. height
 - Temp-ampl
 - PS type

3D Replica

Data series Mov Temp

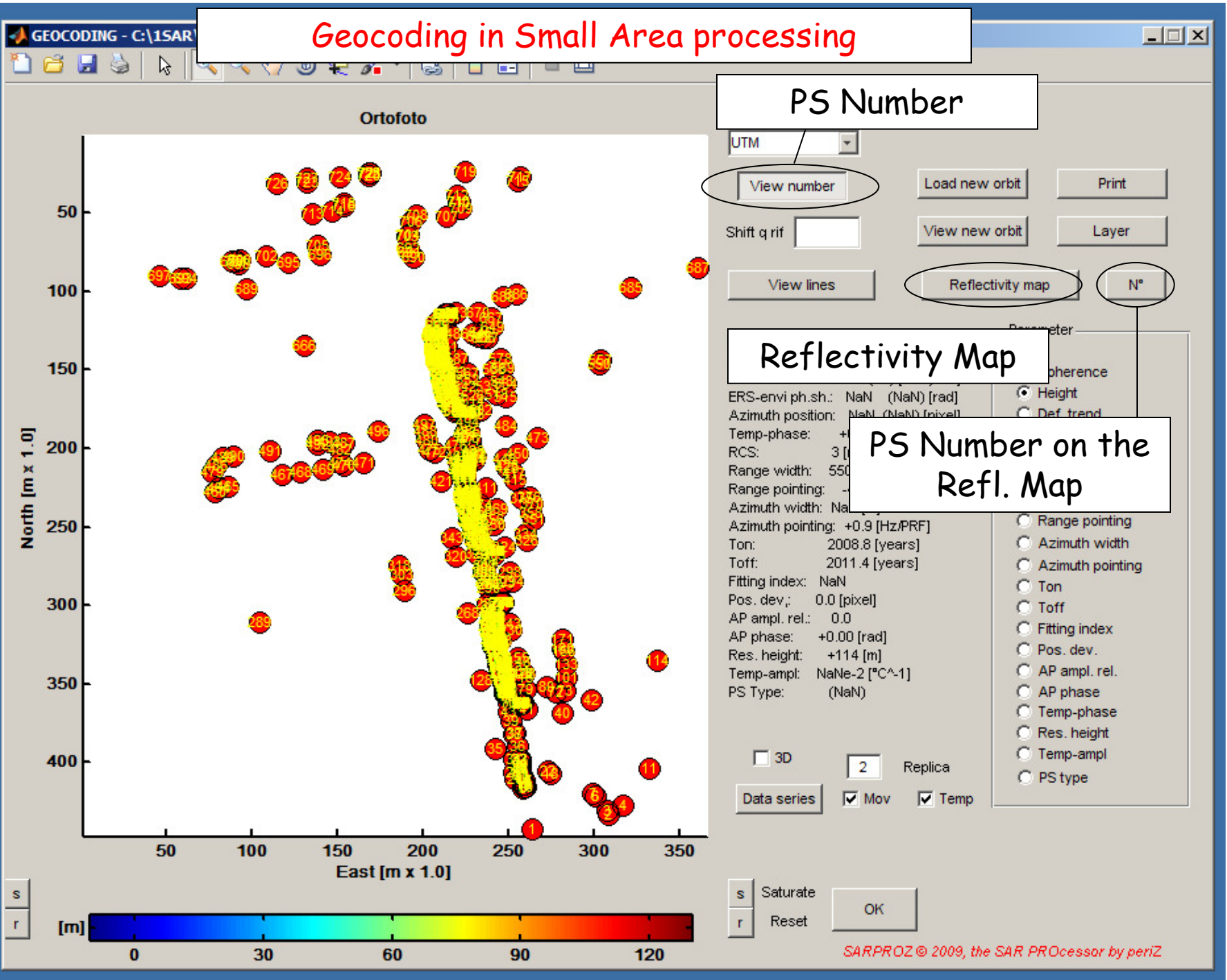


s Saturate

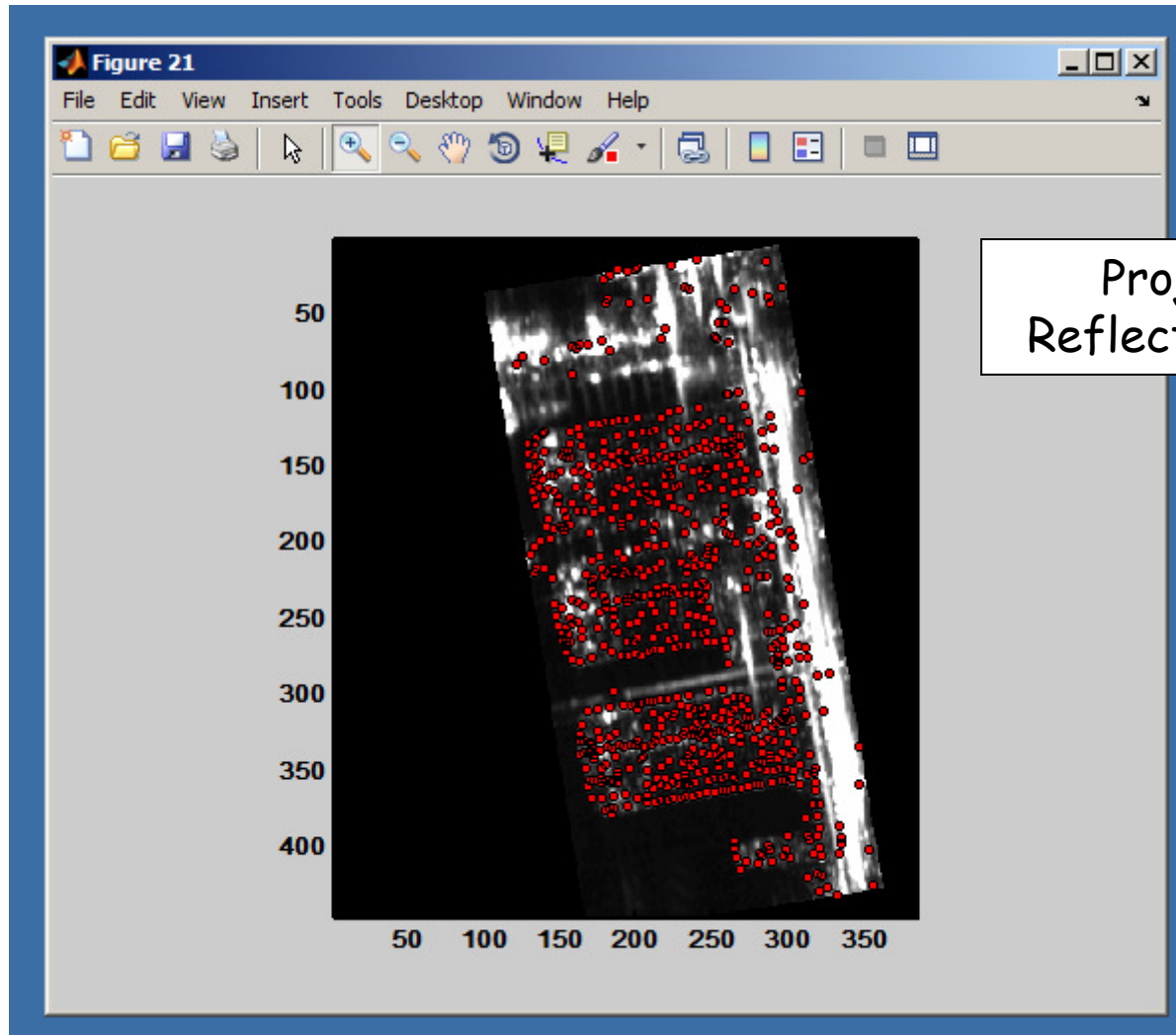
r Reset

OK

Geocoding in Small Area processing

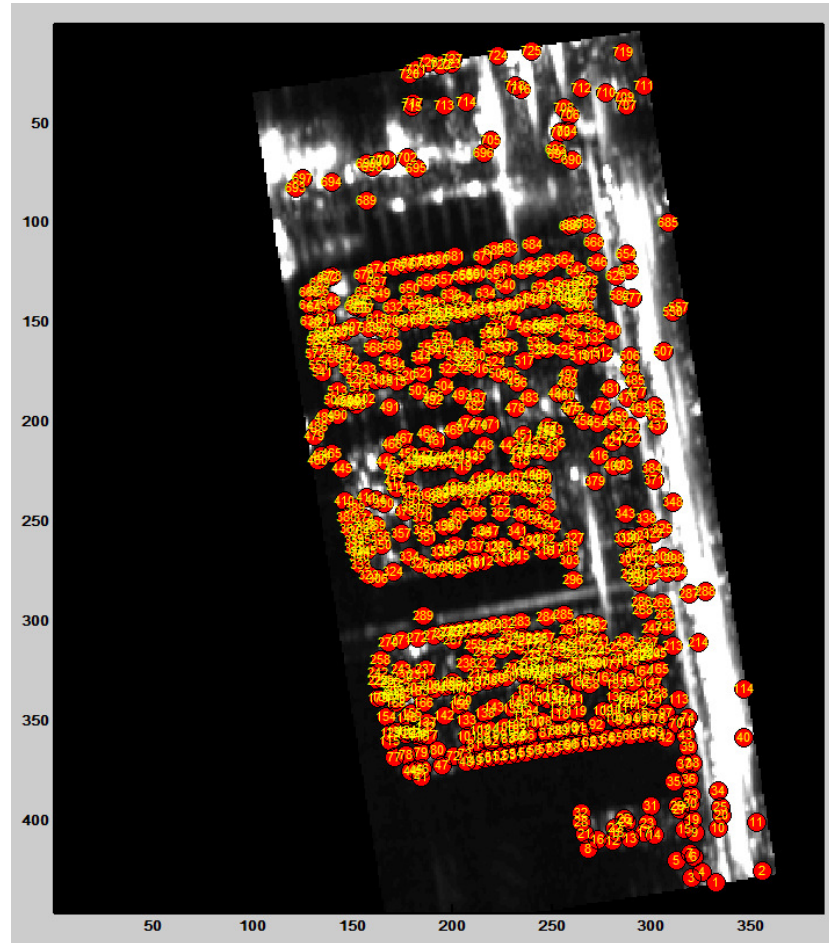


Geocoding in Small Area processing



Projected
Reflectivity Map

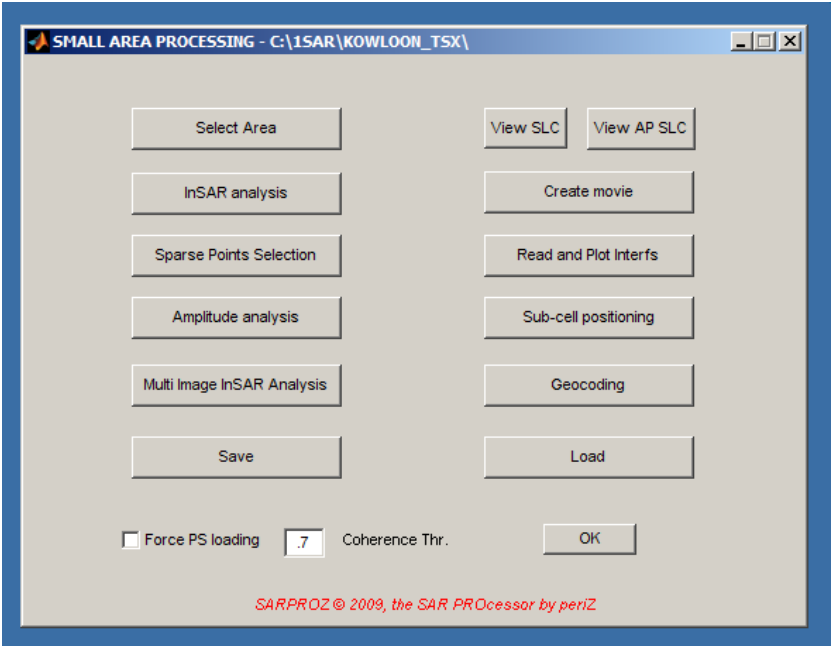
Geocoding in Small Area processing



Projected
Reflectivity Map
with PS Number

Small Area processing

Save the area



Load the area

