

Impact of Perpendicular and Temporal Baseline Characteristics on InSAR Coherence Maps

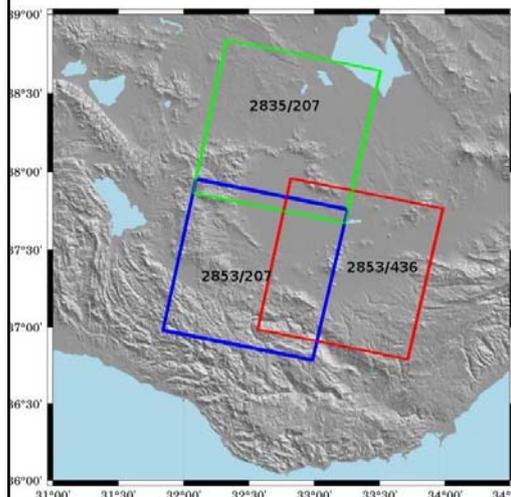
FIG Working Week 2012
 Knowing to manage the territory, protect the environment, evaluate the cultural heritage
 Rome, Italy, 6-10 May 2012

Fatma CANASLAN & Aydin USTUN

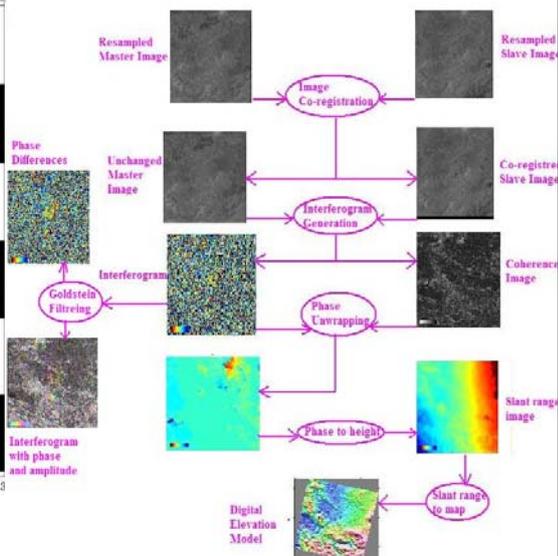
Selcuk University, Turkey

SELECTION OF ENVISAT ASAR DATA AND DATA PROCESSING STEPS

Location of the area covered by tracks and frames according to Konya closed basin



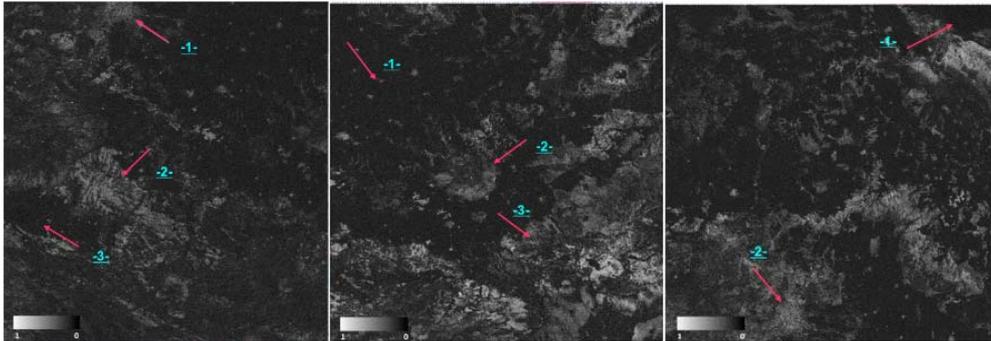
The interferogram creation for processed images is performed by process steps shown



SAR images → project application to ESA

ASAR data selected between 2003 & 2009 belonging to ENVISAT satellite.

Coherence Maps and Importance of Appropriate Baseline Value



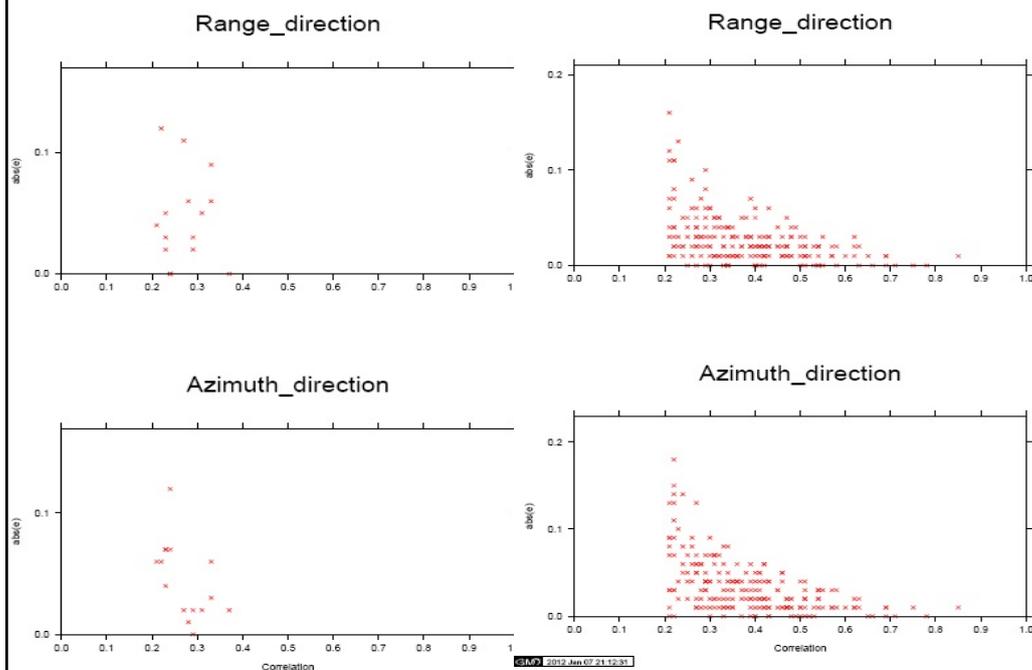
We generated several coherence maps from interferograms. These are generally incoherence because of decorrelation but for this research we choose three sample which give significant results.

The coherence value ranges from 0 (the interferometric phase is just noise) to 1 (complete absence of noise).

Nine Envisat ASAR mission data pairs

Frame	Track	Acquisition Date (Master-Slave)	Temporal Baseline (date)	Perpendicular Baseline (m)	Mean Coherence
2835	207	30 Sept. 2003 – 13 Jan. 2004	105	432	0.439862
		30 Sep. 2003 – 1 Jun. 2004	245	315	0.461686
		26 May. 2009 – 30 Jun.2009	35	-97	0.684723
2853	207	15 July.2008 – 30 Jun.2009	350	-64	0.618105
		13 March.2007 – 1 Apr. 2008	385	101	0.544005
		13 March.2007– 15 July. 2008	490	331	0.516425
2853	436	22 Feb.2007 – 7 May.2009	805	274	0.588917
		31 Jul.2008 –13 Nov. 2008	185	-86	0.715729
		31 Jul.2008 – 7 May.2009	280	245	0.576934

There's two sample of relation between absolute error and correlation in range and azimuth direction

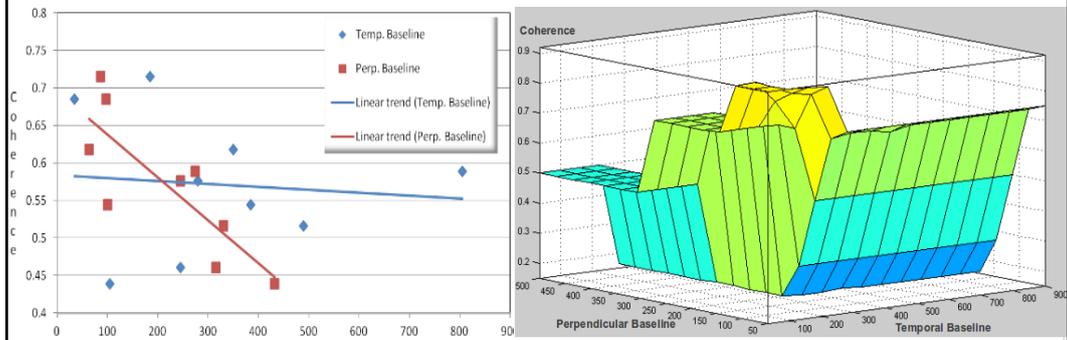


Sample of incoherence and significant coherence results on range and azimuth direction

CONCLUSIONS

Graphic with the help of numerical values of perpendicular and temporal baseline relationship to mean coherence

Perpendicular baseline effect is a little greater than temporal baseline effect.



Perpendicular and temporal baseline correlation to mean coherence

From the analysis of InSAR images the following general conclusions on the obtained coherence can be drawn:

- Urban areas and areas with exposed rocks mountain a high level of coherence
- Vegetated areas and agricultural fields generally show low coherence
- Water basins do not show a sufficient level of coherence

Thank You...