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# ***Interactive comment on “Advanced interpretation of land subsidence by validating multi-interferometric SAR data: the case study of the Anthemountas basin (northern Greece)” by F. Raspini et al.***

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Review of paper :Advanced interpretation of land subsidence by validating multi-interferometric SAR data: the case study of the Anthemountas basin (northern Greece)" by F. Raspini, C. Loupasakis, D. Rozos, and S. Moretti

General Comments

The paper reports InSAR observations on the Anthemountas basin (south of Thes-

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saloniki, Greece) for the period 1995-2001. One important aspect of this work is the relation of surface subsidence with the location of the Thermi Fault, a normal fault on the northern border of the Anthemountas basin. I remain sceptical on the possible association of this fault with patterns of surface subsidence detected by the InSAR/WAP technique. It is much better to collect more data (InSAR, seismological etc) and propose any causative relations. However, the remaining part of the paper is convincing, i.e. there is a hydrogeological signal inside the Anthemountas basin detected by InSAR/WAP. The signal is stronger in the coastal areas and especially in the "Macedonia" airport area. Overall, I recommend minor revisions on the following four (4) points.

#### Specific comments

1) According to the 2010 Zervopoulou active fault map of the greater Thessaloniki Fault the Thermi Fault is a 5-km long, E-W striking fault dipping to the south (the fault appears as a red line in the map of Figure 13, north of the airport, going through a range of LOS velocities without a clear trend). The Zervopoulou map is included in her PhD thesis published by AUTH University in 2010. What the authors refer to as 'Thermi Fault, F-Th', with a NW-SE strike, is an inactive normal fault. Therefore, I suggest to the authors to modify Fig.1 & Fig 13 and remove the label F-Th from the NW-SE black line. This correction implies that all text referring to possible relations between fault activity (aseismic motion or creep) and InSAR LOS measurements should be removed from this paper. Fig. 14 could be retained only in case the authors present a 1995-2001 seismicity profile along the same line. If not the correlation between LOS subsidence and location of ACTIVE faults is very weak and it is not convincing.

2) For historical reasons, subsidence in the Thessaly plain has been detected by InSAR since early 2000s (please see reference by Ganas et al., 2006; Salvi et al., 2004; Vassilopoulou et al., 2013) Ganas, A., Salvi, S., Atzori, S., & Tolomei, C., 2006. Ground deformation in Thessaly, Central Greece, retrieved from Differential Interferometric analysis of ERS-SAR data. 11th International Symposium on Natural and Human Induced Hazards & 2nd Workshop on Earthquake Prediction Abstract Volume,

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June 22-25, 2006, Patras, Greece, page 41. Salvi, S., Ganas, A., Stramondo, S., Atzori, S., Tolomei, C., Pepe, A., Manzo, M., Casu, F., Berardino, P. & Lanari, R., 2004. Monitoring Long-Term Ground Deformation by SAR Interferometry: Examples from the Abruzzi, Central Italy, and Thessaly, Greece. 5th International Symposium on Eastern Mediterranean Geology, Thessaloniki, Greece, 14-20 April 2004, Reference T7-17. Vassilopoulou, Spyridoula ; Sakkas, Vasileios ; Wegmuller, Urs ; et al., 2013, Long term and seasonal ground deformation monitoring of Larissa Plain (Central Greece) by persistent scattering interferometry, CENTRAL EUROPEAN JOURNAL OF GEO-SCIENCES Volume: 5 Issue: 1 Pages: 61-76 DOI: 10.2478/s13533-012-0115-x

3) Try to identify the WAP reference point using Google Earth and report type of reflecting surface and associated geology.

4) It is interesting to make a comment on the nature of the PS surfaces inside the Macedonia Airport at is appears that the reflecting surfaces are the rough (uneven, bumpy) ones despite their E-W or N-S orientation, i.e. not the operational runways themselves for they smoother (flatter). This is important because of the text written in page 1233, that "...linear structures with a north-south oriented component are expected to be more coherent..."

#### Technical corrections

1) In Figure 2 the curve labels are not visible. I suggest either use B/W background (e.g. a DEM) and use red for the curves/labels or keep the background image and replace the yellow with red colour for the curves and replace the black numbers also with red.

2) In Figure 1: explain label F-An In Figure 1: explain black dotted line (catchment) in legend In Figure 1: add names of places or areas (e.g. Chalkidiki) mentioned in text

3) Figure 5 (histograms of PS) should follow the appearance of Figure 6 (map of PS) in the figure's sequence of the paper.

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A. Ganas Athens, 1 August 2013.

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