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Discussions

Interactive comment on "Recent land subsidence caused by the rapid urban development in the Hanoi urban region (Vietnam) using ALOS InSAR data" *by* V. K. Dang et al.

Anonymous Referee #1

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Taking the Hanoi city as site, the authors presented a land subsidence monitoring and interpretation study by means of L-band ALOS PALSAR time series Interferometry. Although the applied MT-InSAR approach was familiar in the InSAR research community, they conducted an interdisciplinary analysis, implying the challenges of rapid urban development related with severe land subsidence. It can be accepted for publication after a major revision. The corresponding comments are as follows: 1) P6157 line 3, regarding to Shanghai (subsidence), please citing Lin H., Chen F.L.*, Zhao Q., Land deformation monitoring using coherent target-neighborhood networking method combined with polarimetric informationâĂŤâĂŤa case study of Shanghai, China. International Journal

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Interactive Discussion

Discussion Paper

of Remote Sensing, 32(9):2395-2407, 2011.

2) P6163 line 1, here geometric decorrelation should be replaced by temporal decorrelation. Line 8 and 9, Fig2a and Fig2b should not be noted here, instead, they should be noted after line 24; because those two figures show the interferogram formation, and have no relationship with PS or distributed scatters.

3) P6164, line 1-4. What three others contributions? The sentence is too vague for understanding. It needs to be rewritten. 4) P6165, line 8, PS and distributed scatterers (DS) should be both included in Figure 3-8; and thus the term "persistent scatterers" here is not right. The same for following descriptions throughout the manuscript. 5) P6168, line 4, figure 7b only show motion time series of TT18A, what for block TT18B? 6) p6170, 5.2.1 Housing development: the downward pressure from high-building weight could be another contribution for land subsidence, I think. 7) P6173, line 20-24. From the description, it tells us that the underground water level has arisen (from -34 m in 2006 to -5 m in 2010). This phenomenon is contradicted with severe land subsidence. Need clarification. 8) P6177, line 14-15. The recharge of the aquifer by rainfalls could be a reasonable cause; however, the derived results cannot support this conclusion. Suggest removing this sentence.

9) The seasonal movements with regards to rainfall are not evident in Fig.5 and 6. Why the motion dispersion is suddenly increased after 2009 (Fig. 7c)? More evidence and discussions are required.

10) From the results, I found that the spatial extension of subsidence is relatively small. What is the hinder cause? Can it be caused by residual heights compared with GDEM? The perpendicular baseline of PALSAR is large, e.g. -2000-+2000 m in this case, resulting in evident phases related with residual heights. Thus, the residual height estimation is a challenging task; I suggested adding more descriptions on this issue. Furthermore, the cross-interferogram of FBS and FBD, the corrective orbit manoeuvre of PALSAR are other problems, please referring to:

[1]S.Samsonov, “Topographic Correction for ALOS PALSAR interferometry,” IEEE Transactions on Geoscience and Remote Sensing, vol.48, no.7, 3020-3027, 2010. [2]Chen F. L., Lin H., Zhou W., Hong T.H., Wang G., “Surface deformation detected by ALOS PALSAR small baseline SAR interferometry over permafrost environment of Beiluhe section, Tibet Plateau, China”, Remote Sensing of Environment, 138: 10-18, 2013.

11) Figure 7. “The third point of our InSAR time series was arbitrary located along the regression line of the leveling data.” What does this mean? It seems cannot be found in this Figure. Figure 9, for location of profile A-B, refer to Fig.7? It should refer to Fig.4 instead, I think.

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., 1, 6155, 2013.