

Interactive comment on “Estimation of three-dimensional crustal movements in the 2011 Tohoku-oki, Japan earthquake from TerraSAR-X intensity images” by W. Liu et al.

C. Xu (Referee)

cjxu@sgg.whu.edu.cn

Received and published: 21 January 2015

General comments: Liu et al. first use TSX images to derive 2-D offset fields with a previous proposed method, and then construct 3-D surface displacements in the 2011 Tohoku-oki, Japan earthquake basing on the three sets of detected 2-D movements. The results compared with the GPS observations indicate that the application is acceptable. Although the methods used in this study are not new, the work is very well. I consider the manuscript is good and appropriate for the NHESSD.

Specific comments: 1. Because the study area (Miyagi Prefecture) is located in the Pa-

C3160

cific coast, the displacements derived from TSX images were mainly produced by the earthquake and tsunamis. But the movements from the tsunamis are not crustal movements. “Crustal movements” in the title should be change to “surface movements”. 2. As we known, the precision of offset field depends on the resolution of pixel (image size). The common precision of the pixel tracking method is about 1/10 pixels. The images data used in the study are the EEC Level 1B data, which were resampled in 1.25 m. But the original size of pixel is about ~3 m. Does the oversample improve the precision? 3. The title of section 3 is GEONET, but the authors presented many materials about the method of pixel offset tracking. The title cannot cover the content.

Technical corrections: 1. P7385/L3: change to “Interferometric Synthetic Aperture Radar (InSAR)” 2. P7385/L21: the dramatic surface changes were produced by not only tsunamis but also the earthquake. 3. P7386/L15-23: The details of the images can be summarized in a table. 4. P7388/L13-14: How about the effect of the postseismic motion? 5. In Figure 1(a), the path names (A, B and C) can be changed to the actual Path Numbers.

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., 2, 7383, 2014.