

# Detection of postseismic deformation for the 1995 Hyogo-ken Nanbu earthquake by JERS-1/InSAR

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Crustal deformation associated with the Hyogo-ken Nanbu Earthquake ( $M=7.3$ ) was detected by many measurements such as SAR interferometry (InSAR), GPS and so on. Especially, the result of InSAR was first application in Japan, and it showed its usefulness. Since, InSAR have been used as one of the useful tool to detect crustal deformation in Japan. By the improvement of detection accuracy associated with advancements in InSAR analysis technique, the detection of small crustal deformation such as postseismic deformation was attempted in recent study. After the Hyogo-ken Nanbu Earthquake, several centimeters of postseismic deformation was detected by GPS measurements (Nakano et al., 1997), and it must be possible to also detect by InSAR. If it can be detected by InSAR, it must provide to us more detailed information about the postseismic deformation. Then we attempted to detect the postseismic deformation from SAR data pair acquired after its earthquake. SAR data used in this study were acquired in 6 Feb. 1995 and 18 Sep. 1998 (recurrence time is 1320 days) by JERS-1 satellite installed L-band SAR. These data were processed by GSISAR coded by Dr. Mikio Tobita and Dr. Satoshi Fujiwara of Geographical Survey Institute of Japan. It is expected that the accurate crustal deformation was obtained, because good coherence was obtained and the atmospheric disturbance was few. In following, we discuss about the postseismic deformation around Nojima Fault in Awaji Island. Crustal deformation that the northwestern area of fault approached to satellite in 5 cm in line-of-sight direction component (LOS) was detected in Nojimahikinoura and Nashimoto areas which were the south end area of Nojima Fault. On the other hand, the crustal deformation was negligible in the northern area from there. Although we attempt to compare the postseismic and the coseismic deformations, the coherence in the northwestern area of fault was significantly low in SAR interferogram showing the coseismic deformation, and its comparison was difficult. Then, we attempted to compare the SAR interferogram with the coseismic deformation obtained from photogrammetric surveys. The northwestern area of fault in Nojimahikinoura and Nashimoto was displaced to eastward (approaching to satellite) and upward (approaching to satellite), and it indicates that the direction of coseismic displacement is that with high sensitivity in InSAR observation. On the other hand, the northern area from there was displaced to eastward (approaching to satellite) and downward (leaving to satellite), and it indicates that the direction of coseismic displacement is that with low sensitivity in InSAR observation. Then, it is expected that phase difference is large in Nojimahikinoura and Nashimoto area and small in northern area. It is consistent with the postseismic deformation pattern obtained from InSAR. Furthermore, the uplift (approaching to satellite) coseismic deformation was detected in Matsuhou area, north end of Awaji Island, and such deformation pattern was also obtained in SAR interferogram showing the postseismic deformation. From these results, it was shown that the postseismic deformation pattern is similar to the coseismic deformation pattern. It was shown that the wider postseismic deformation pattern obtained from GPS measurements was similar to the coseismic deformation pattern (Nakano et al., 1997), and it is consistent with the result in this study. Some deformation patterns were also obtained in Kobe area, however, it is not clear if these relate with the earthquake. Then more detailed analyses and investigations are needed.