Surface deformation triggered by the Niigataken Chuetsu-oki Earthquake and its relationship to distribution of damage

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We found the phase shift patterns in SAR interferograms captured by 'Daichi' satellite suggesting the occurrences of local ground subsidence and lateral soil flow triggered by the Niigataken Chuetsu-oki Earthquake in 2007, and reported it at the annual meeting of Japan Association for Quaternary Research Meeting in August 2007 (Une et al., 2007). It was followed by our further analyses to clarify detailed ground surface deformation such as separation of displacement vectors into quasi-vertical and east-west components using SAR interferograms from two different orbits. Besides, the Geographical Survey Institute carried out retrieval survey of geodetic control points in and around Kashiwazaki city, which are supposed to be displaced associated with the earthquake. From the result of this survey we captured the horizontal displacement vectors of the control points, which are consistent in general with other observation results such as GPS and SAR interferometry. We infer that most of the surface deformations in and around Kashiwazaki city were resulted by the occurrences of lateral flow of the sandy soil on the sand dune. Such phenomena are supposed to have influenced on the concentration of damage to buildings.