



Mapping the spatial and temporal pattern of land subsidence in the city of Toos, northeast Iran, using the integration of InSAR, continuous GPS and precise levelling

M. Motagh (1), Y. Djamour (2), T. Walter (1), Z. Moosavi (2), S. Arabi (2), and J. Zschau (1)

(1) GeoForschungsZentrum (GFZ) Potsdam, Germany, (2) National Cartographic Center (NCC), Tehran, Iran.

motagh@gfz-potsdam.de / Phone: +49-331-2881299

y-djamour@ncc.neda.net.ir / Phone : +98-21-66001090

twalter@gfz-potsdam.de / Phone: +49-331-2881253

zschau@gfz-potsdam.de / Phone : +49-331-2881200

It was recognized that part of the region in north-east Iran near Toos, about 20 km north of the city of Mashhad, the provincial capital with a population of more than 2 million, is subject to land subsidence. We integrate various geodetic data to examine the spatial and temporal evolution of land subsidence. Precise levelling observations over 10 years and continuous GPS measurements spanning ~ 1 year indicate subsidence to a maximum of several centimetres per year near Toos. However, because these observations are too sparse to provide accurate information about the extent and distribution of subsidence, we integrate them with InSAR measurements which greatly enhance our ability to map the complex deformation occurring in space and time. The combination of InSAR, continuous GPS and precise levelling provides important insight into the physical processes controlling the land subsidence in the city.