SBAS-InSAR Analysis for Investigating Ground Subsidence in Changzhou, China

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ABSTRACT:

Changzhou is a prefecture-level city in southern Jiangsu province, located on the southern bank of the Yangtze River, and the city is situated in the affluent Yangtze Delta region of China. In recent 30 years, Groundwater over-pumping has becoming more and more serious, which has led to serious ground subsidence in Changzhou city. The stationary monitoring station of Mahang located on the southern of Changzhou city, which monitors ground subsidence continuously and automatically. The monitoring results of Mahang stationary monitoring station show that ground of Changzhou does not subside after 2008. Considering the measurements of other methods such as leveling and GPS, the subsidence may be controlled due to groundwater exploitation plan since 2004. In our work, 41 ENVISAT ASAR images between May 2004 and October 2009 were selected for analyzing Changzhou ground subsidence based on SBAS method, and a novel method was proposed to correcting the SBAS results using the result of stationary monitoring station. We validated the results by comparing subsidence measurements collected in some points of this area with precise leveling, which are in good agreement. Our purpose is that: 1) obtained distribution characteristics and trend of ground subsidence; 2) determined whether or not subsidence deterioration has been controlled.