

Ground deformation signals detected by SAR interferometry time series analysis along the Chao Praya River areas

Akiko Tanaka^{1*}, Aritoshi Mio¹

¹Geological Survey of Japan, AIST

The metropolitan area of Bangkok, Thailand, has been subsided during the past decades. This ground deformation has been monitored using leveling surveys since 1978 and InSAR (Interferometric Synthetic Aperture Radar) analysis. These results show that the Bangkok metropolitan city is subsiding with a rate of 20 mm/year in recent years, due to the law limiting groundwater pumping since the late 1980s, although in 1981 the highest subsidence rate up to 120 mm/year had been recorded in the eastern area [Phien-wej et al., 2006]. However, these studies were focused in the Bangkok metropolitan city using C-band satellites images.

In this study, we applied the method of measuring long-term land subsidence by InSAR time series analysis using ALOS (Advanced Land Observing Satellite) PALSAR (Phased Array type L-band SAR) data acquired between 2007 and 2010 to investigate ground deformation in and around Bangkok area. The ground deformation were detected near the Tha Chin river, which is a tributary of the Chao Phraya river and flows westerly from the Chao Phraya through the central plains of Thailand until it mouths into the Gulf of Thailand. We compared our results with previous leveling and InSAR studies to find an overall consistency in the deformation estimates. The deformation rates have been monitored, with velocity a maximum rate of about -20 mm/year, and showed consistent with previous studies [e.g., Aobpaet et al., 2009]. These results verify the validity of the method and data used.

Keywords: InSAR time series analysis, ground deformation, ALOS/PALSAR, Chao Praya River