



Coseismic and Post-Seismic Deformation of the 2008 Dangxiong Earthquake, Tibet, from ALOS SAR Interferometry

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Tibet Plateau (TP) is one of the most prominent and tectonically active region in the world. This region was formed as a result of continent collision between the Indo-Australian and Eurasian Plate since 50 Ma, Early Eocene, and still in process. A series of rifts was developed on the TP, extending from north to south across the Bangongcuo-Nujiang suture and the Yarlung-Zangbo suture to the Himalayas. The Yadong-Gulu rift extending about 500km is the longest of the seven rifts. It is located in the east of convergence zone and ~100 km north of Lhasa, the most populous town on TP.

Since 1264 A.D., the Yadong-Gulu rift has experienced frequent large earthquakes. In 2008, an Mw 6.3 earthquake occurred in the Dangxiong county near Yangyi graben, which is in the northern section of Yadong-Gulu rift. In this study, we use the synthetic aperture radar (SAR) data of L-band ALOS PALSAR with a long wavelength (23.6 cm) and a large incidence angle (34°) to solve the problem of coherence loss in the rugged terrain. One interferometric result shows a significant coseismic deformation occurred near the epicenter with a maximum displacement of 30 cm along the line of sight (LOS) of the satellite. We produce a time series of post-seismic deformation from 2008 to 2011 by small-baseline subset (SBAS) method. After deducting seasonal oscillations associated with freezing-thawing cycle of the permafrost, the maximum LOS displacement is around 3 cm per year after the earthquake and still continuing.

Keywords: Coseismic, Post-Seismic, Dangxiong earthquake, SBAS