

MONITORING OF ACTIVE DEFORMATION IN COLLISION ZONE OF EASTERN TAIWAN FROM PS-INSAR AND CONTINUOUS GPS OBSERVATION

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ABSTRACT: The Longitudinal Valley fault (LVF) is a plate suture fault between the Luzon arc of the Philippine Sea plate and the Chinese continental margin of the Eurasian plate, in eastern Taiwan. With respect to Paisha station, S01R, the stations of Coastal Range shows the velocities of 40.5-72.3 mm/yr towards azimuth 307°-309°. The stations in the LV and Central Range revealed velocities in the range 19.0-49.3 mm/yr towards azimuths 285°-318°. From 1980 to 2008, 5 times index swarm earthquakes occurred in Hualien, Taiwan. These events occurred at the north segment of LVF where the last disaster events were the ML 7.3 Hualien-Taitung earthquake sequence in 1951. This earthquake sequence occurred along the segmented 150-km-long LVF, and was composed of the reverse and strike-slip events that ruptured four segments. This study presents the results about vertical velocity on the Coastal Range and Longitudinal Valley in eastern Taiwan from Continuous GPS

using data acquired from 1999 to 2009. In the vertical velocity pattern, the significant subsidence appears in northern Coastal Range about -15.7 ± 0.3 mm/yr, but the uplift in southern Coastal Range about 20.6 ± 0.2 mm/yr respectively. Furthermore, the vertical variation presents a discontinuity across the Chihshang Fault nearly 28.9 ± 1.2 mm/yr. This study presents new results about creeping on the southern part of the Longitudinal Valley from interferometric synthetic aperture radar (InSAR) using data acquired by ALOS satellite and provided by JAXA. We use 10 SAR images acquired from January 2007 to February 2010 by the PALSAR sensor, an L-band radar (wavelength = 23cm) which provides a much better coherence than in C-band (5.6 cm) over the Longitudinal Valley (a rural area surrounded by mountainous tropical areas with a dense vegetal cover). Data are processed with the “Stanford Method for Persistent Scatterers” (StaMPS) that can perform time series analysis on a dense set of selected points called Persistent Scatterers (PS).