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Modeling the Crustal deformation from Continuous GPS, leveling and PS-InSAR in eastern Taiwan

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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 Longitudinal Valley and Central Range revealed velocities in the range 19.0-49.3 mm/yr towards azimuths 285˚-318˚. We index the large earthquake (more than ML$\geqq$5.0) which happens after the swarm earthquakes and affects continuous GPS time series variation patterns in northern LVF. The results about vertical velocity on the Coastal Range and Longitudinal Valley in eastern Taiwan from Continuous Global Positioning System (CGPS) using data acquired from 1999 to 2009. In the vertical velocity pattern, the significant subsidence appears in northern Coastal Range about -15.7 $\pm$0.3 mm/yr, but the uplift in southern Coastal Range about 20.6 $\pm$0.2 mm/yr respectively. Furthermore, the vertical variation presents a discontinuity across the Chihshang Fault nearly 28.9 $\pm$1.2 mm/yr. These results can be compared with the leveling data and Persistent Scatterer InSAR (PS-InSAR). We use the Poly3D to invert the CGPS, leveling and PS-InSAR data. We find different segments are controlling the Longitudinal Valley. The LVF represents locked at the surface in the northern part, but the approximate 3.1 mm/yr creeping rate in the southern segment.