



Insights on the 2008 Wenchuan Earthquake from GPS network observations

S. Jin (1,2), W. Zhu (3), and J. Park (2)

(1) Center for Space Research, University of Texas at Austin, Texas 78759, USA (sg.jin@yahoo.com), (2) Korea Astronomy and Space Science Institute, Daejeon 305-348, Korea (sgjin@kasi.re.kr), (3) Shanghai Astronomical Observatory, CAS, Shanghai 200030, China

On May 12 2008, the devastating Wenchuan earthquake (Mw 8.0) occurred at the eastern edge of the Tibetan plateau, killing thousands of people in the western Sichuan basin in China. Robust seismic signals around the globe could estimate the gross nature of this event, but the details of rupture are usually obscure due to lack of near-field observations. Geodetic measurements can provide unique insights on the details of continental events, such as kinematic rupture deformation and abnormal signals, etc. In this paper, the GPS observation data are collected from China national continuous and campaign GPS network, and satellite observation signals on the mainshock of this event are extracted and investigated from GPS position observations and ionospheric delays. The co-seismic GPS deformations indicate a total moment of 2.38×10^{21} Nm, equivalent to Mw=8.1 and nearly identical to the seismological estimate. Furthermore, co-seismic total electron content (TEC) disturbances show a shock-acoustic waves propagation at mean velocity of about 700 m/sec.

Keywords: Wenchuan Earthquake; Co-seismic deformation; Co-seismic ionospheric disturbance (CID); GPS