

Surface Deformation Studies in Kachchh, India Using InSAR and DGPS

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Kachchh rift basin in Gujarat has been seismically active since historical period. The devastating Bhuj earthquake of 26th January 2001 is counted as one of largest intraplate events. After a period of quiescence, since 2006 the area became active with several earthquakes of magnitude >5 and numerous low magnitude events. These are attributed to post-seismic relaxation of the region. We made an attempt to study the seismic deformation using differential interferometry (DInSAR) aided with corner reflectors and DGPS observations. We analysed ENVISAT ASAR interferogram and DGPS results of 3 permanent and 11 campaign stations from June-2008 to October-2009. No signals related to the deformation could be identified on the interferogram. Analysis of DGPS data for a period of 2007-2009 shows very low deformation rates of about 1mm/yr in vertical and 2mm/yr in horizontal directions. We speculate that the inferred deformation rate may be resolved with the analysis of more SAR data at regular time intervals. However, the currently operating SAR sensors like ENVISAT, ALOS have very limited data availability over India. We expect that the indigenous Radar Imaging Satellite (RISAT) of Indian Space Research Organisation proposed to be launched by the end of 2010 will be able to provide continuous SAR data to monitor the area on an operational basis.