

The Utilization Of Spatial Filtering for Tectonic Strain Study Based on SUGAR (SUMATRAN GPS ARRAY) Data 2006 – 2008 Study Case: The September 2007 Bengkulu Earthquake

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SUMMARY

The September 12th 2007 Earthquake (Mw8.4) followed by Mw7.8 earthquake in September 13th, furthermore aftershock with a strong magnitude also happened in Bengkulu. This earthquake was one of the earthquake that observed by GPS continuous station at Sumatera, SuGAR, since 2002. This SuGAR data allowed us to observe the strain with occurred during interseismic dan postseismic process. In this research, time-series analysis being done in spatial domain by using spatial filtering technique. This technique is useful to eliminate outlier data and describe seasonal variation in the region of study. Data in a good group has quality improvement about 0.2-5 mm in horizontal component and 1-7 mm in vertical component, data in a medium group has quality improvement about 2-8 mm in horizontal component and 3-6 mm in vertical component, then data in a bad group has quality improvement about 3-8 mm in horizontal component and 17-30 mm in vertical component. Displacement average value in all station during interseismic are $0.029\text{m}\pm 4\text{mm}$ for horizontal and $0.008\text{m}\pm 8\text{mm}$ for vertical. The average displacement in coseismic are $0.640\text{m}\pm 4\text{mm}$ for horizontal and $0.037\text{m}\pm 11\text{mm}$ for vertical. Furthermore, the average displacement in postseismic are $0.084\text{m}\pm 5\text{mm}$ for horizontal and $0.013\text{m}\pm 10\text{mm}$ for vertical. This research describe the strain tectonic during slip accumulation that observe in the region of The September 2007 Bengkulu earthquake on SuGAR measurement period 2006 until 2008. This research give us compression value $-0.088 \mu\text{strain}$ and extension value $0.282 \mu\text{strain}$.