INTISARI

Kepulauan Mentawai terletak di bagian paling barat Sumatera dan termasuk wilayah zona subduksi Segmen Mentawai. Pada tanggal 10 Juli 2013 Kepulauan Mentawai diguncang gempa tektonik. Gempa tektonik ini terjadi secara berturut dengan kekuatan 5,2 SR dan 5,3 SR. Gempa tektonik yang terjadi menunjukkan adanya aktivitas tektonik yang tinggi di zona subduksi Segmen Mentawai, sehingga diperlukan penelitian untuk pemantauan aktivitas tektonik di zona subduksi tersebut. Oleh karena itu, penelitian ini bertujuan untuk melakukan pemantauan deformasi geometrik akibat gempa tektonik 10 Juli 2013 di Segmen Mentawai pada fase *interseismic*, fase *coseismic*, dan fase *post-seismic*.

Penelitian ini menggunakan data pengamatan 10 stasiun SuGAr selama tahun 2013. Data pengamatan ini diolah menggunakan perangkat lunak GAMIT/GLOBK 10.5 untuk mendapatkan koordinat dan simpangan baku koordinat setiap stasiun pada masing-masing fase gempa tektonik 10 Juli 2013. Selanjutnya dilakukan perhitungan dan analisis deformasi geometrik menggunakan perangkat lunak MatLab 2013. Selain itu, evaluasi perubahan koordinat dan kecepatan pergeseran koordinat stasiun SuGAr juga dilakukan dalam penelitian ini.

Hasil penelitian ini adalah stasiun SuGAr mengalami deformasi pada fase *interseismic*, *coseismic*, dan *post-seismic*. Pergeseran horisontal stasiun SuGAr pada sistem koordinat kartesi 3D mencapai fraksi sentimeter, sedangkan pergerakan vertikalnya mencapai fraksi milimeter. Arah kecepatan pergeseran horisontal stasiun SuGAr pada fase *interseismic* cenderung bergerak ke arah utara-timurlaut yang menunjukkan adanya akumulasi energi. Arah kecepatan pergeseran horisontal stasiun SMGY dan TRTK pada fase *coseismic* memiliki pergeseran yang berlawanan arah dengan arah pergeseran pada fase *interseismic*. Hal ini menunjukkan adanya fase *coseismic* gempa tektonik 10 Juli 2013. Selain itu, gempa tektonik 10 Juli 2013 mempengaruhi perubahan koordinat stasiun SuGAr secara signifikan setelah dua jam *pasca* gempa tektonik terjadi. Namun, pada fase *post-seismic* atau setelah enam bulan *pasca* gempa tektonik 10 Juli 2013, koordinat stasiun SuGAr di Segmen Mentawai belum mencapai suatu kondisi kesetimbangan dengan fluktuasi cenderung semakin menurun hingga fraksi milimeter.

Kata kunci : deformasi, *interseismic*, *coseismic*, *post-seismic*, Segmen Mentawai.

ABSTRACT

Mentawai Islands were located in the western part of Sumatera where included Mentawai segment subduction zone. On July 10, 2013, earthquake has occured in Mentawai Islands. This tectonic earthquakes occurred successively with a force of 5.2 RS and 5.3 RS. The tectonic earthquake showed that subduction zones of Mentawai segment had high tectonic activity. Therefore, it was needed a research for monitoring tectonic activity in subduction zones of that segment. This research was aimed to monitor geometric deformation toward tectonic earthquake occurence on July 10, 2013 in Mentawai segment on interseismic, coseismic, and post-seismic phases.

This research used data observation of 10 stations SuGAr's during year 2013. It were processed using GAMIT/GLOBK 10.5 software to get the coordinates and its standard deviation in every station on each phase of the tectonic earthquake. Then, the calculations and analysis of geometric deformation used MatLab software. Besides, the evaluation of coordinates movement and velocity of SuGAr's stations were also performed in this research.

The results of this research showed that SuGAr's stations were deformed on interseismic, coseismic, and post-seismic phases. Horizontal movement of SuGAr's stations on the 3D cartesian coordinate system reached centimeters fraction, while vertical movement reached milimeters fraction. The direction of horizontal velocity of SuGar's stations on interseismic phase tend to move toward the north-northeast that showed the accumulation of energy. The direction of horizontal velocity of SMGY and TRTK stations on coseismic phase had an opposite direction movement with interseismic phase. It was indicated that there was coseismic phase of the tectonic earthquake on July 10,2013. Besides, the tectonic earthquake on July 10,2013, affected the coordinates movement of SuGar's stations significantly in two hours after the earthquake. However, on post-seismic phase or six months after the tectonic earthquake on July 10,2013, the coordinates of SuGar's stations in Mentawai segment haven't been reach an equilibrium state with the fluctuations that tend to decrease up to milimeters fraction yet.

***Keywords* :** *deformation, interseismic, coseismic, post-seismic, Mentawai Segment.*