

ABSTRAK

ANALISIS MEKANISME FOKUS GEMPA *VOLCANO-TECTONIC A* (VTA) GUNUNG MERAPI PERIODE MARET 2023

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19/442441/PA/19190

Gunung Merapi mengalami peningkatan aktivitas vulkanisme secara signifikan pada bulan Maret di tahun 2023. Pemantauan seismisitas dilakukan dengan analisis hiposenter dan mekanisme fokus berdasarkan polaritas gelombang P untuk mengetahui aktivitas magmatismenya. Data yang digunakan adalah 768 gempa *volcano-tectonic* tipe A (VTA) yang terekam di jaringan seismik Gunung Merapi karena paling dominan dan paling berasosiasi dengan migrasi magma. Pengolahan dilakukan menggunakan perangkat lunak *SeisComp3* untuk mendapatkan distribusi hiposenter dan mekanisme fokus gempa.

Berdasarkan hasil analisis, gempa VTA Merapi periode Maret 2023 memiliki zona seismisitas tinggi pada kedalaman 3 sampai 5.6 km dari puncak. Pada 1-11 Maret terjadi osilasi pada distribusi hiposenter dengan orientasi barat-timur yang diduga terjadi karena kenaikan dan penurunan intensitas migrasi magma yang menyebabkan melebar dan menyempitnya rekahan pada dinding magma. Pelebaran maksimum terjadi pada 3 Maret.

Gempa VTA dominan yang dihasilkan berupa sesar *oblique normal* dan *oblique-reverse* dengan orientasi WNW-ESE (barat-barat laut timur-tenggara) diduga karena aktivitas gerakan migrasi magma secara fluktuatif yang menyebabkan rekahan mendekati horizontal pada dinding konduit. Kemunculan gempa VTA pada 1-11 Maret 2023 diduga merupakan rangkaian suplai dan migrasi magma ke permukaan yang mengakibatkan munculnya rekahan pada dinding saluran migrasi magma dan diikuti dengan erupsi pada 11 Maret 2023.

Kata Kunci : Gunung Merapi, Gempa *Volcano-Tectonic A* (VTA), Mekanisme Fokus

ABSTRACT

ANALYSIS OF FOCAL MECHANISM OF THE VOLCANO-TECTONIC A (VTA) EARTHQUAKE AT MERAPI VOLCANO DURING MARCH 2023 PERIOD

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Mount Merapi had a significant rise in volcanic activity in March in 2023. Seismicity monitoring is performed using hypocenter analysis and focal mechanisms based on the polarity of the P wave to determine its magmatic activity. Hypocenter analysis and focus mechanisms with the method of determining the polarity of the P wave are performed to determine its magmatic activity. The data used is 768 type A volcano-tectonic earthquakes (VTA) recorded in the Mount Merapi seismic network because they are most dominant and most associated with magma migration. The processing was carried out using SeisComp3 software to obtain the hypocenter distribution and the earthquake focal mechanism.

According to the analysis, the VTA Merapi earthquake for the March 2023 period had a high seismicity zone at a depth of 3 to 5.6 km from the peak. On 1-11 March, there was a oscillation in the west-east oriented hypocenter distribution that was supposed to occur due to the rise and decrease in the magma migration intensity leading to the expansion and narrowing of the fissures on the wall of magma. The maximum expansion occurred on 3 March.

The dominant VTA earthquake in the form of oblique-normal and oblique-reverse faults with orientation WNW-ESE (west-northwest east-southeast) stress direction is thought to be due to fluctuating magma migration movement activity which causes near-horizontal fractures in the conduit walls. The appearance of the VTA earthquake on March 1-11 2023 is thought to be a series of supply and migration of magma to the shallows which resulted in the appearance cracks in

the walls of the magma migration channel and followed by an eruption on March 11, 2023.

Keywords: Merapi, Volcano-Tectonic Earthquake A (VTA), Focal Mechanism.