

INTEGRATED STUDIES OF EARTHQUAKE PRECURSORS IN INDONESIA

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Integrated studies of earthquake precursors have been done by the research and development center of BMKG since 2010. Studies of earthquake precursors carried out in stages and sustainable that is focused on geophysical, geo-atmospheric and geochemical parameter. This studies are to develop test methods that have been developed with field data in Pelabuhan Ratu, West Java. The target for third year is to studies of vp/vs ratio, magnetic, impedance of EM wave, temperature, humidity and radon concentration as well as verify the predictability of earthquake precursors based on information that has been done.

Research focused on identifying the physical parameters of the character as an earthquake anomaly precursor in the Pelabuhan Ratu, West Java, Indonesia along 2012. The analysis of vp/vs ratio using earthquake catalog and phase report sheet from BMKG. Electromagnetic parameter data used is the magnetotelluric data that observed at geophysical observatories of Pelabuhan Ratu which was collaboration with Chiba University (Japan). Observation data of the radon gas concentration, air temperature and humidity in the soil obtained from RAD7 that installed with sensor of soil gas probe is planted in the ground as deep as 1.2 meters. And surface temperature data is the maximum temperature (Tmax) and minimum temperature (Tmin) were recorded using a mercury thermometer.

Based on the analysis of vp/vs ratio, the accumulation of stress in rocks began to be detected around 1-3 months before the earthquake occurred. Results of electromagnetic parameters analysis using polarization of magnetic data and impedance of EM wave obtained precursor anomaly approximately 14-56 days before the earthquake occurred, so these parameters are included in short-term precursors are likely due to the electrokinetic and microcrack before the accumulation of energy released as earthquakes. Parameters of temperature and humidity as well as radon gas precursor patterns detected about 9-30 days before the earthquake happened so that the parameters are included in short-term precursors. Radon gas and temperature anomalies associated with the deformation in the region of observation before the earthquake occurred.

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