

The remarkable strain changes related to the 2004 Sumatra earthquake observed by the borehole strainmeter array of TRIES

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The Tono Research Institute of Earthquake Science (TRIES) has been observing the crustal activity at the several observatories within a radius of three kilometers, in Tono central Japan (e.g. Okubo et al; 2004). For the purpose of observation on the dynamic strain changes related to the tele-large/great earthquakes and the near earthquakes which can be felt, the strains in particular, the sampling interval are 1 Hz at the Togari observatory (TGR350 and TGR165), 20 Hz at the Byoubu-san observatory (BYB), which located at about 10 km east of the Togari observatory. These sampling rates are fast compare with the traditional crustal movement observation (e.g. 1 minute, 1 hour). In cooperation with Nagoya University, the output of the extensometers at NAMZ which are in approximately 100 m distance from the TGR350 and TGR165, are also recorded at 1 Hz.

Dynamic strain changes related to the 2004 Off Sumatra earthquake (Mw9.0) were recorded from the borehole strainmeters of Tono crustal movement observatories array located approximately 5000 km northeast of the epicenter. Simultaneously with the dynamic strain changes, the strainmeters at TGR350 and the extensometers at NAMZ recorded the remarkable 'lamp function-like' strain changes whose amplitudes are equivalent to the tidal change, and rise-time are about 1 hour. The same strain changes were recorded also at BYB. Since the epicentral distance is about 5000km, the explanation of these remarkable strain changes by the dislocation theory is very difficult. Although the instabilities of each observation instruments are suspect, it is seen that the possibility is little, because the remarkable strain changes are observed by different observation system, and are observed also at BYB observatory.

We will advance consideration about the mechanism of the strain amplification at the near observatories excited by the dynamic strain changes of the off Sumatra earthquake.