

Gamma-ray fluctuation observed on deep seafloor off Hatsushima Island in Sagami Bay after the 2011 Tohoku Earthquake

Ryoichi Iwase^{1*}, Ichiro Takahashi²

¹JAMSTEC, ²Marine Works Japan, Ltd.

Long-term gamma-ray observation with NaI(Tl) detector attached to the cabled observatory on deep seafloor at a depth of 1175 m off Hatsushima Island in Sagami Bay has been carried out since 2000. It has multi-channel (256 ch) pulse height analyzer and energy spectra of gamma-ray can be obtained.

Temporal fluctuation of net area of each peak in the energy spectra, which corresponds to radiation dose rate, of Bi-214 (U series), K-40 and Tl-208 (Th series) between January 2010 and December 2012 was studied this time. Although each peak shifts to lower channel as time passes because of the aging of the equipment, in order to prevent discontinuity, ROI (Range of Interest) for each peak was set constant and spectra were averaged for one day. Because of the trouble at the shore station caused by typhoon, the observation stopped from 21st September to 5th October in 2011.

Just after the off the Pacific coast of Tohoku Earthquake on March 11th in 2011, sudden increase of radiation dose rate of Bi-214 occurred. It continued to increase until April in 2011. It began to decrease gradually in January until June in 2012. On the other hand, the fluctuations of those of Tl-208 and K-40 are not so significant except sudden decrease in February in 2012 which is probably caused by the work of ROV (Remotely Operated Vehicle) on seafloor near the observatory. The temporal fluctuation of Bi-214 might reflect crustal deformation, however, because of poor resolution in energy spectra, the Bi-214 peak might contain the dose rate of Cs-137 associated with atomic power plant accident to some extent. More detailed analysis would be necessary.

Keywords: Gamma-ray observation, deep seafloor off Hatsushima Island in Sagami Bay, Off the Pacific Coast of Tohoku Earthquake in 2011