Real time monitoring system for mega-thrust earthquake seismogenic zon -Development of DONE-

\# Yoshiyuki Kaneda[1]; Katsuyoshi Kawaguchi[2]; Eiichiro Araki[2]; Sho Kaneko[2]; Michihiro Ohori[3]; Hiroyuki Matsumoto[4]; Shin'ichiro Kamiya[5]; Takeshi Nakamura[3]; Keisuke Ariyoshi[6]; Takane Hori[7]

[1] JAMSTEC,IFREE,DONET; [2] JAMSTEC; [3] JAMSTEC DONET; [4] DSRD, JAMSTEC; [5] DONET, JAMSTEC; [6] DONET (JAMSTEC); [7] IFREE, JAMSTEC

http://www.jamstec.go.jp/jamstec-j/maritec/donet/index.html

1. Intoroduction

In the Nankai trough, mega thrust earthquakes are occurring with an interval of 100-200 years. Especially, in 1854 and 1944, the first ruptures were starting from the Tonankai seismogenic zone ahead of the Nankai seismogenic zone. Therefore the monitoring of Tonankai seismogenic zone is very important to understand the next mega thrust earthquake around the Nankai trough. So, We are developing DONET system (The dense ocean floor network for earthquakes and tsunamis) and will deploy DONET system off Kii peninsula as MEXT project.

2. Development of DONET

In DONET system, some kinds of sensors such as broad band seismometer, accelerometer and precise pressure gauge will be equipped with backbone cable-brunch unit-node-extended cable system in each observatory. This DONET system has 20 observatories, so we will be able to detect detailed phenomena around the Tonankai sesimogenic zone. In developing DONET, we have to evaluate reliabilities of each sensor and to develop brunch unit, node and extendable cable system using ROV. The sensors will be buried in boreholes to suppress current noises using ROV. The result of sensor installation tests shows the advantage of buried sensors rather than sensors on seabed, especially in horizontal components.

3. Applications of DONET

DONET system will provide data of broad band phenomena such as micro seismicity, slow events, strong motions and ocean floor deformations around the Tonankai seismogenic zone in real time. Especially data of pressure gauges will detect not only tsunami but also ocean floor deformation to improve mega thrust earthquake recurrence cycle simulation models using data assimilation. Observations of broad band phenomena will contribute to understand the mega thrust earthquake occurrence system around the Nankai trough and to mitigate damages of earthquakes and tsunamis by early detections rather than land stations. In this paper, we will present the development of DONET(Fig.1) and future plans.