Realtime ocean bottom broadband seismograph array deployed by JAMSTEC in Nankai Trough, Japan

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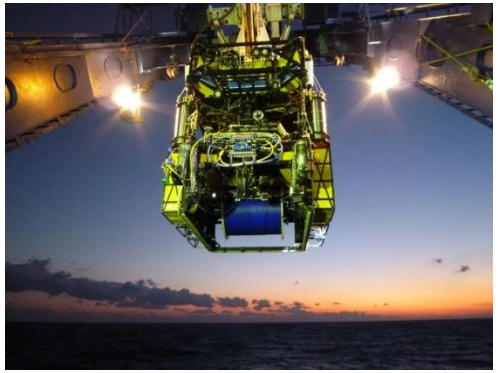
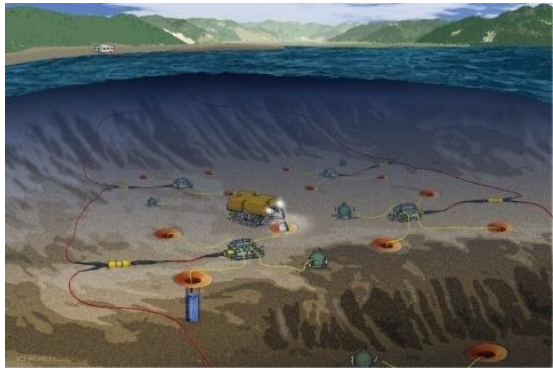
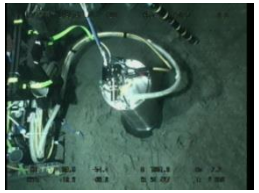
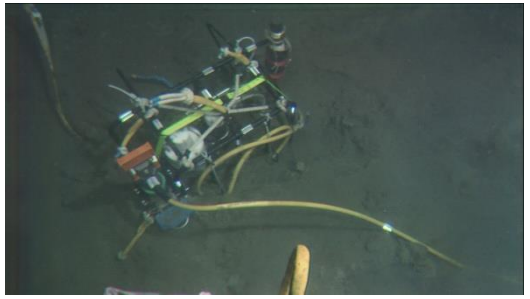
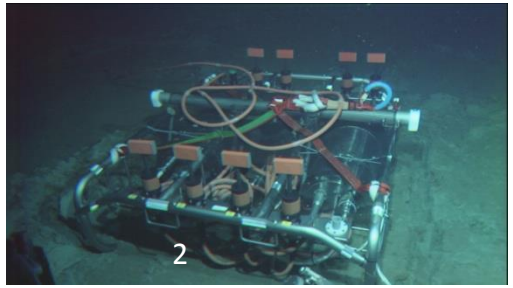




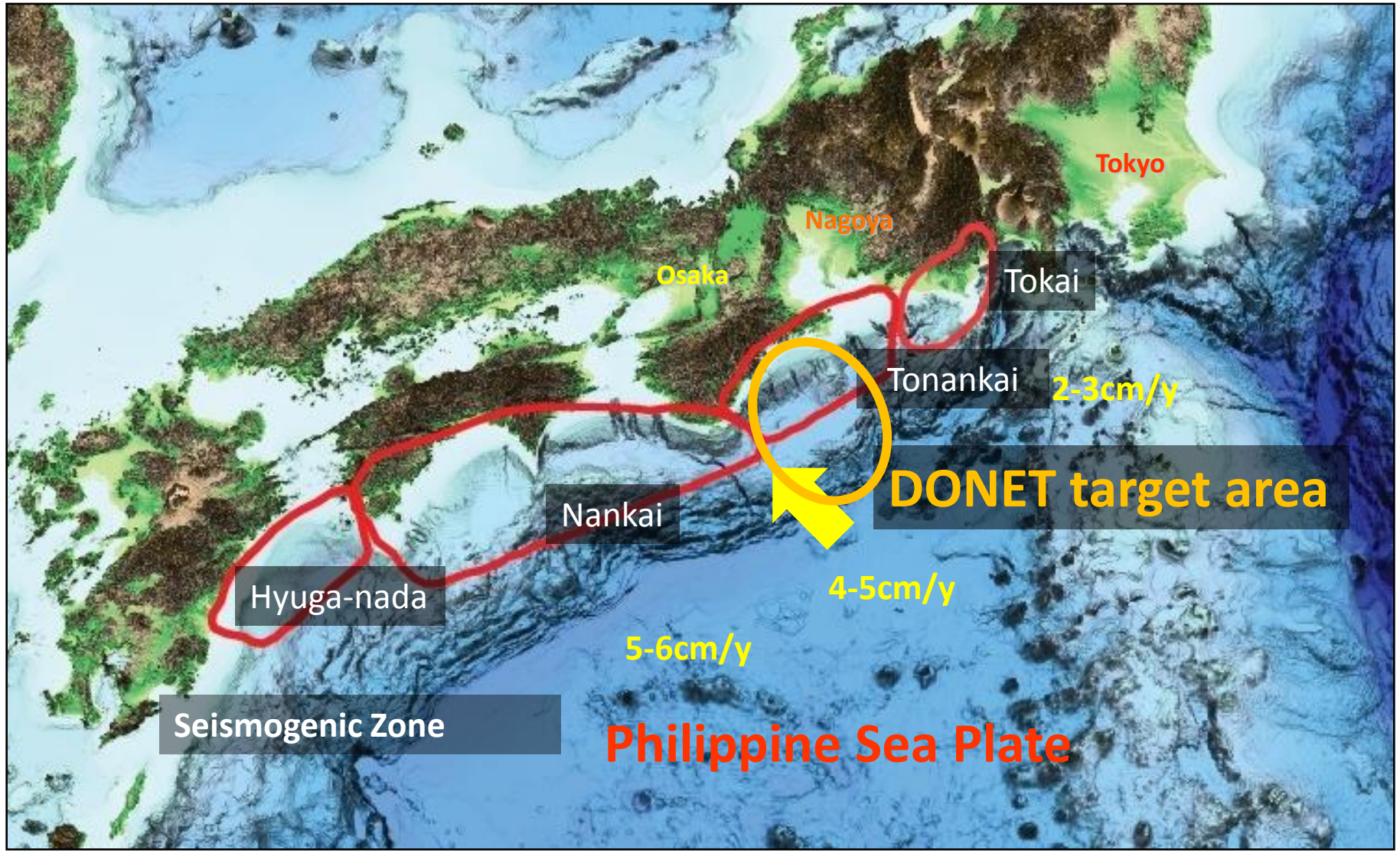
DENSE OCEANFLOOR NETWORK SYSTEM FOR EARTHQUAKE AND TSUNAMIS (DONET)



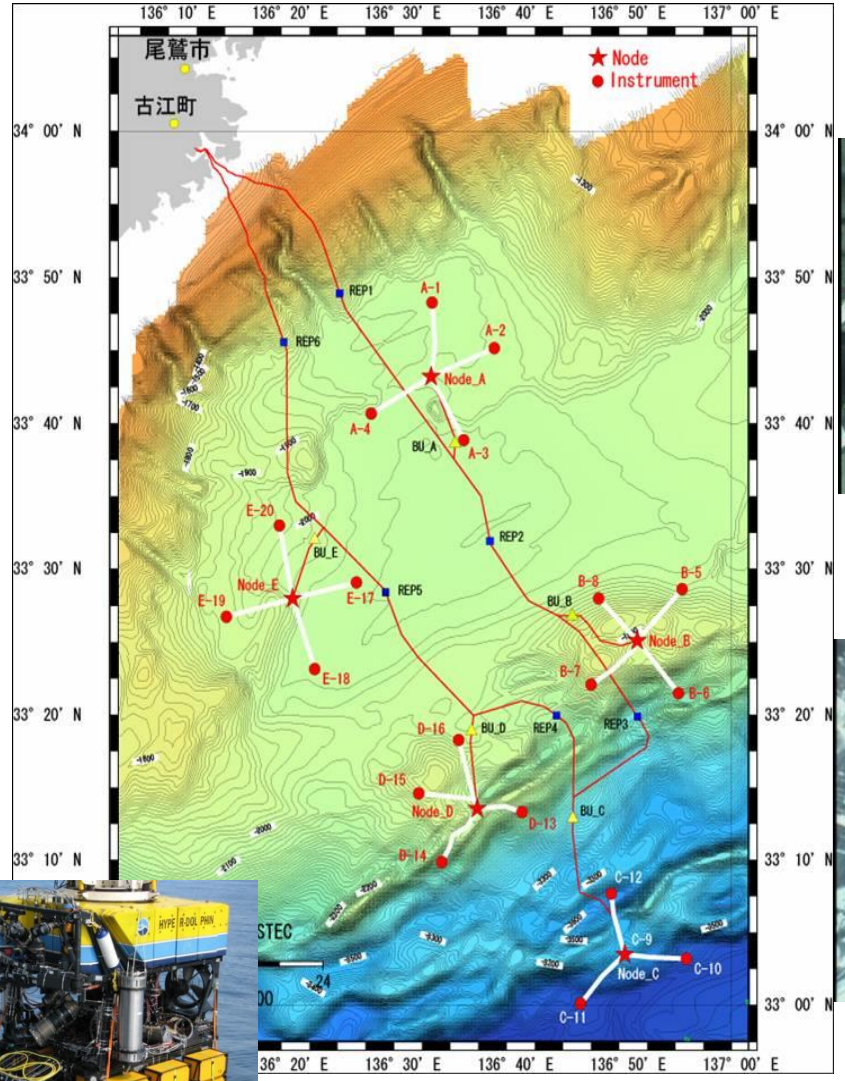


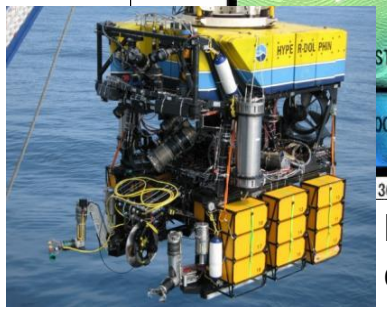


DONET Observation Area



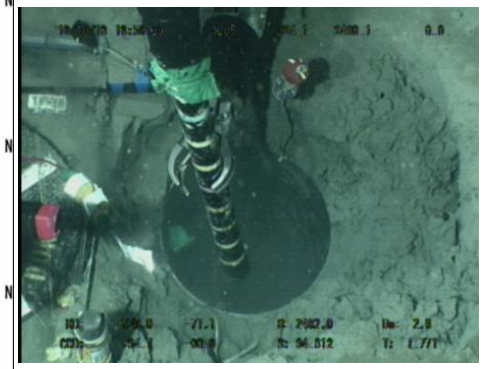
DONET Construction Work



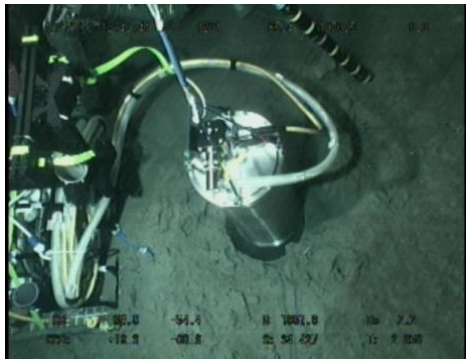


ROV used in the submarine construction work: Hyper-dolphin

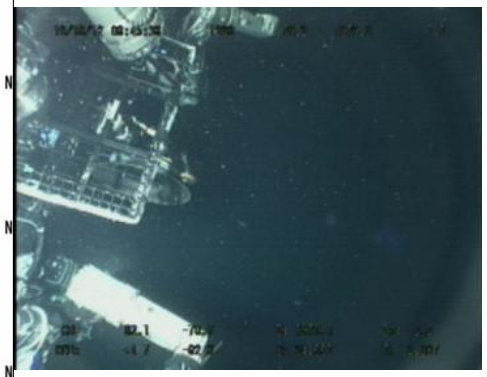
All twenty observatories are working.



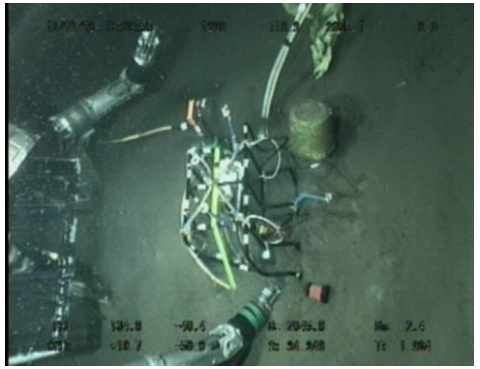
Construction of Installation hole for seismometer



Installation of seismometer



Deployment of extension cable



Installation of sensors

20 ocean bottom observatories had been installed in To-Nankai earthquake rupture area.

Type of instruments:

■Strong Motion Seismometer：Metrozet TSA-100S
■Broadband seismometer：Guralp CMG-3TRH

■Hydrophone：High Tech HTI-99-DY

■Differential Pressure Gauge：Nichiyu Giken Kogyo MA-567000

■Quartz Crystal Pressure Gauge：Paro Scientific 8B7000-2-005

■Precision Thermometer：Nichiyu Giken Kogyo MA-565-2 series

Data Transfer System

the 2011 Tohoku earthquake（Mw 9.0）

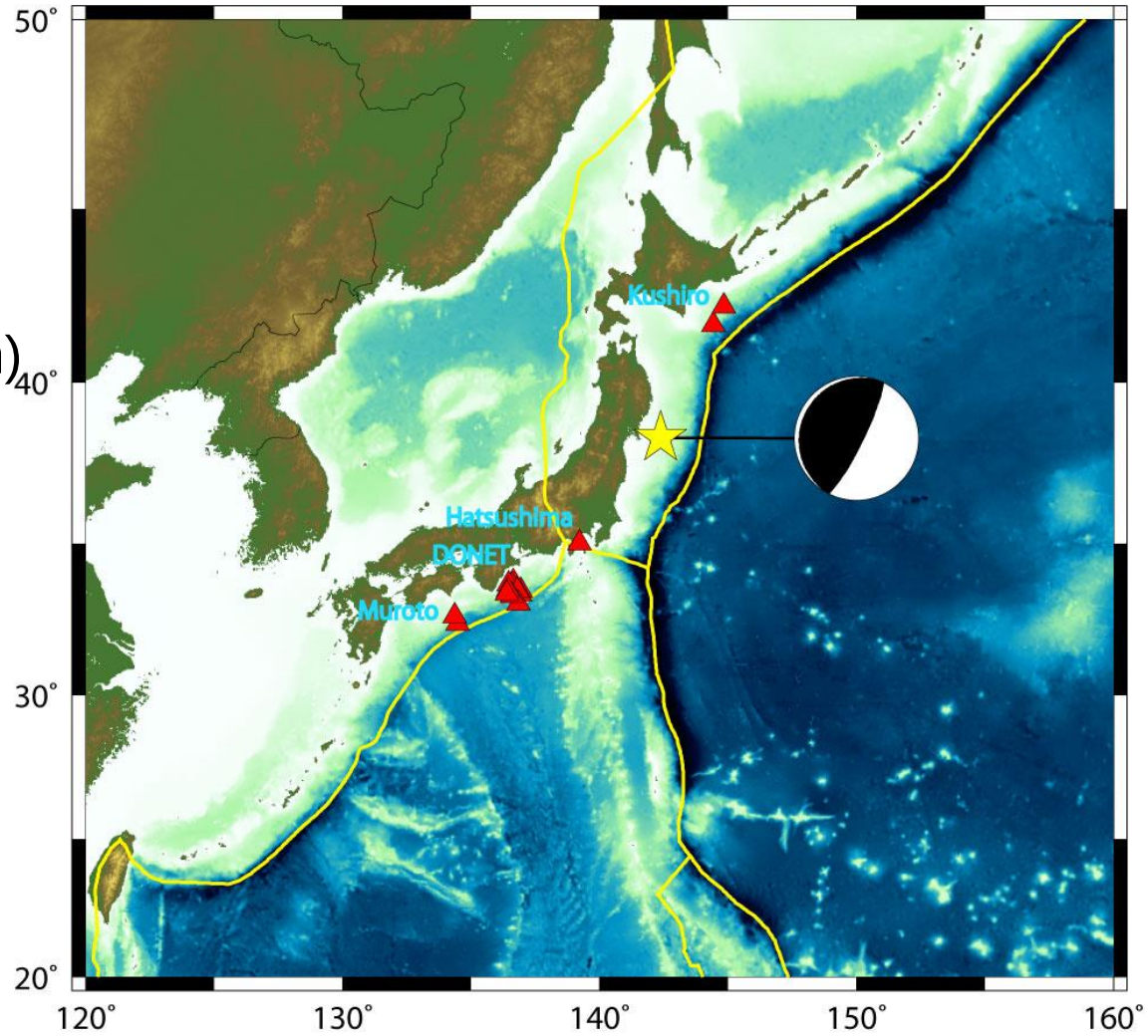
・GMT 5:46(JST 14:46)

・Mw 9.0

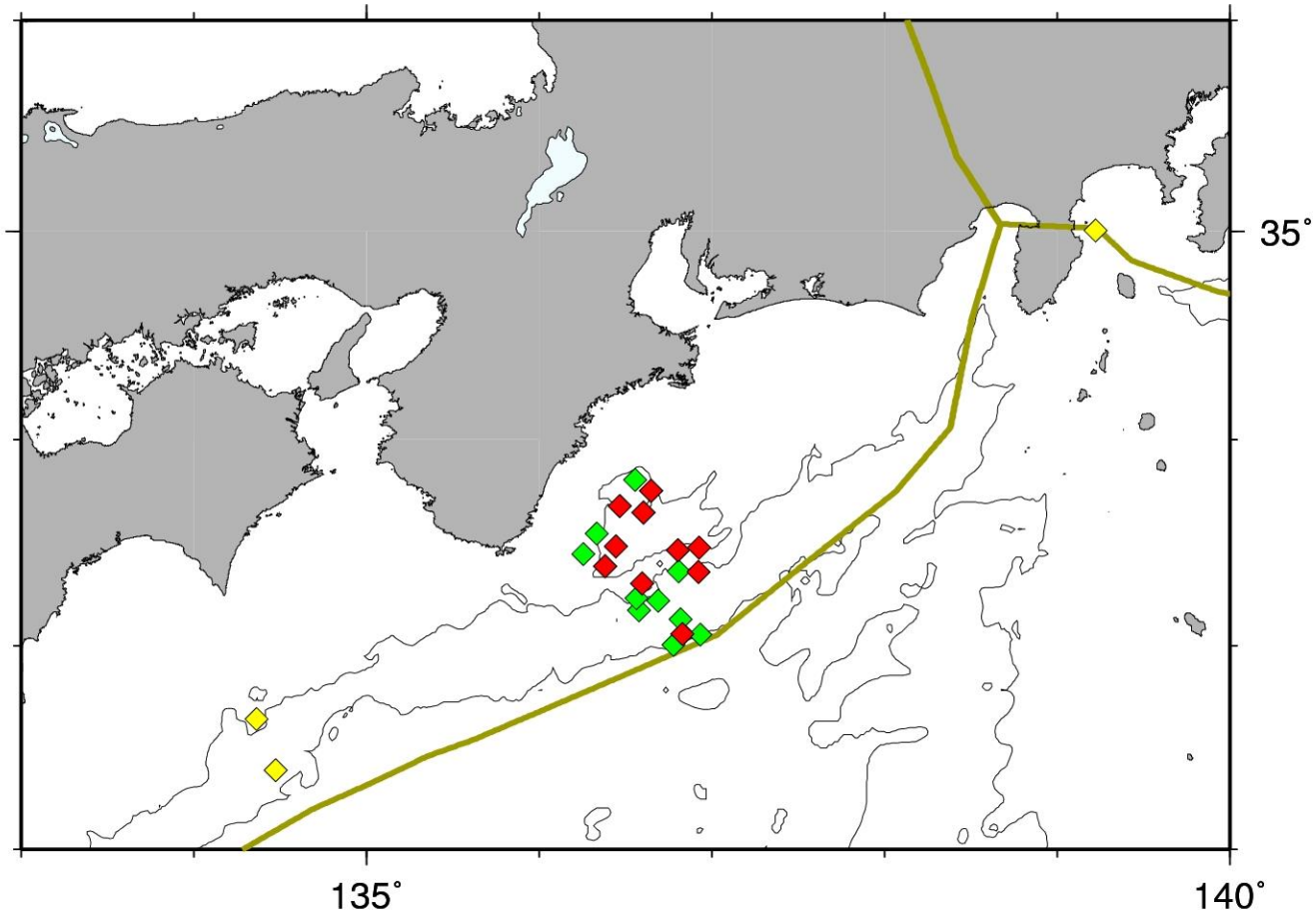
・depth 20 km

・thrust type

(from Global CMT solution)



the 2011 Tohoku earthquake（Mw 9.0）

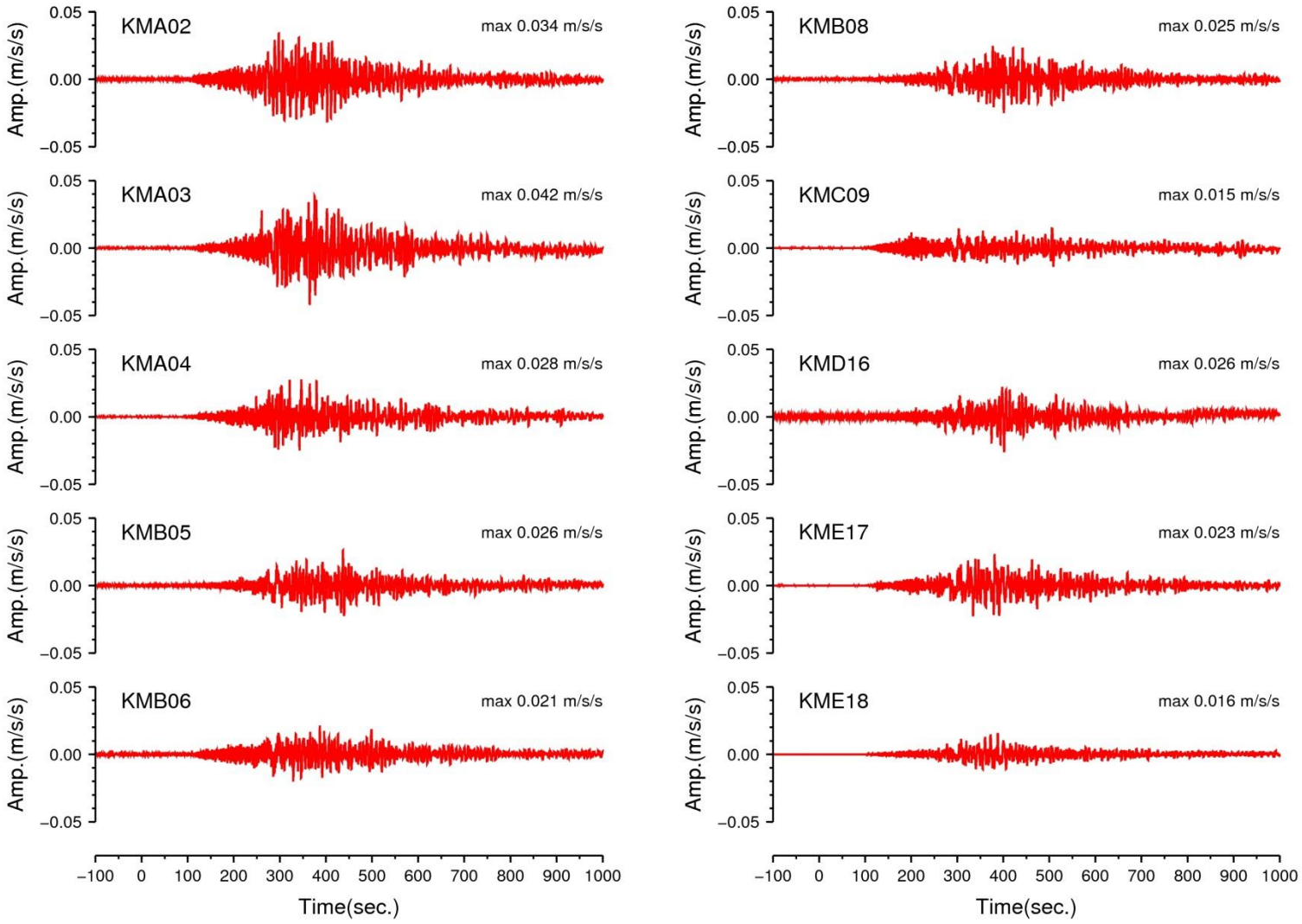


cable type stations

DONET stations

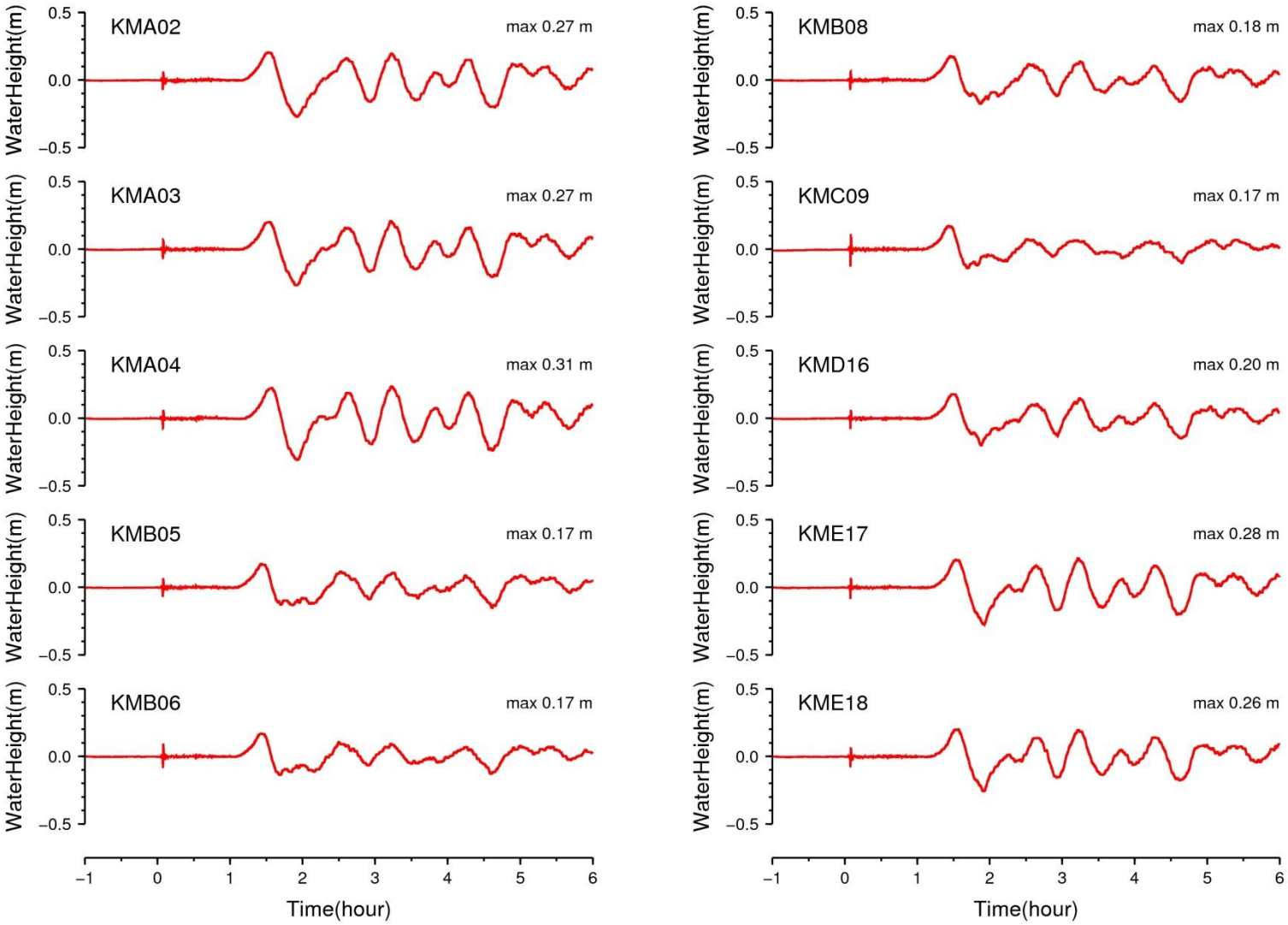
DONET stations not installed at the mainshock

Strong motion waveforms recorded at DONET（time axis based on the origin time）



vertical component

Water pressure waveforms recorded at DONET（time axis based on the origin time）

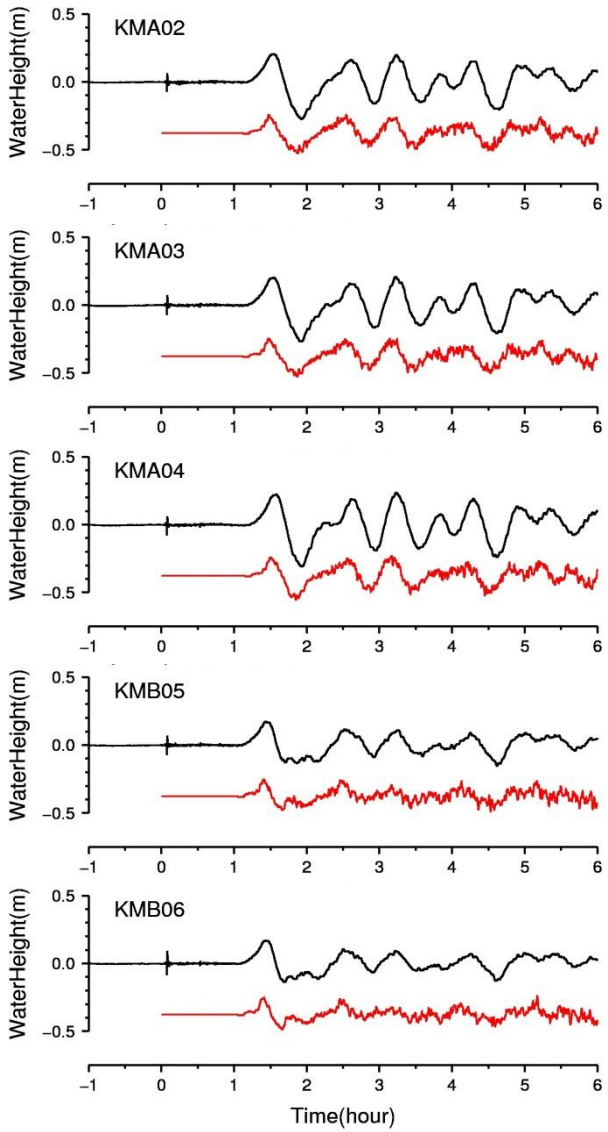


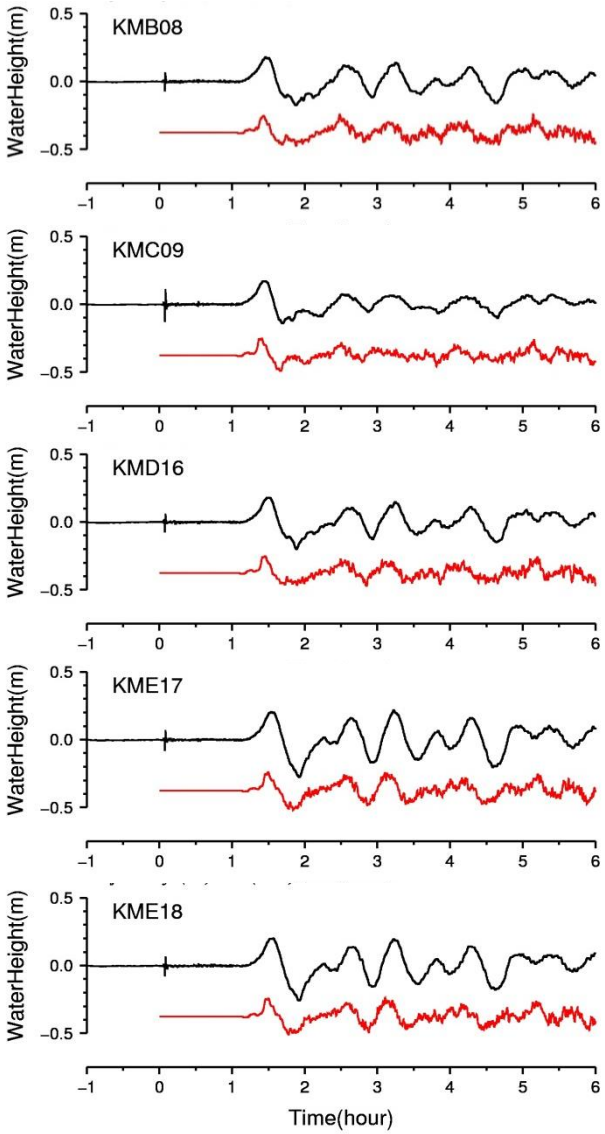
※filtered period: 100-10000 seconds

forward modeling for DONET data

black: observed waveform

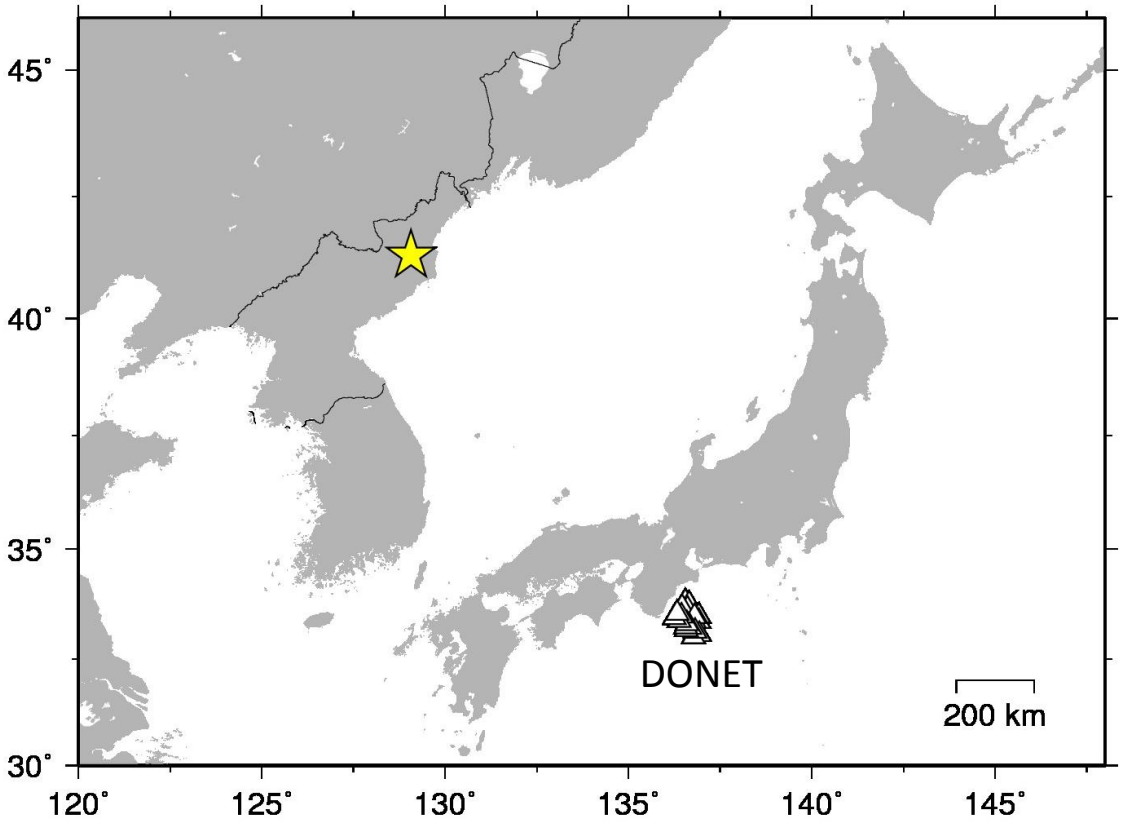
red: synthetic waveform





North Korean event on February 12, 2013

2013/02/12 02:57:51UTC
41.3060N 129.0650E
Mw 5.1（USGS）

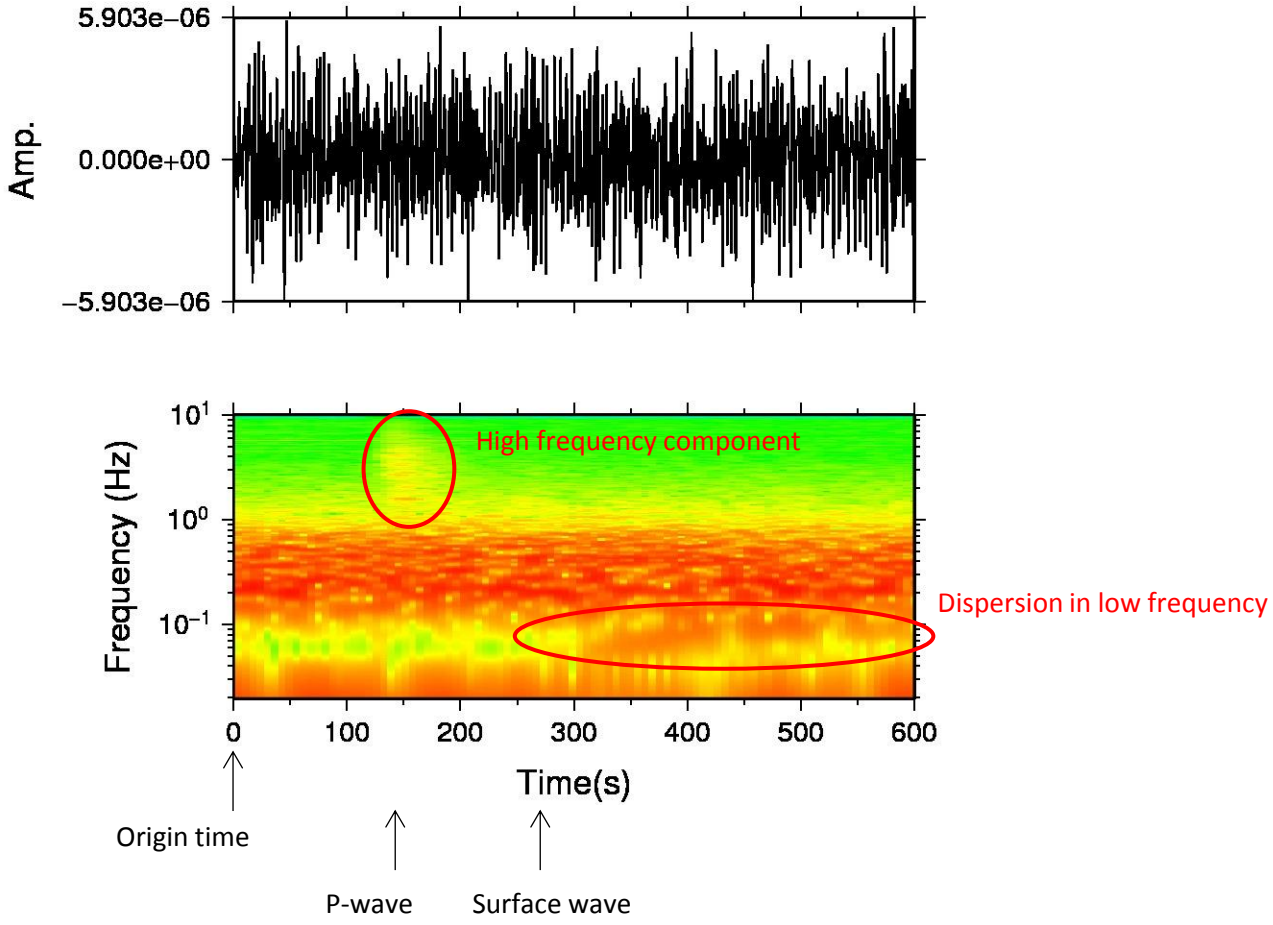


Epicentral distance to DONET(KMA03)：1077 km
P-wave travel time：140 sec
Surface wave（4.0 km/s）travel time：267 sec

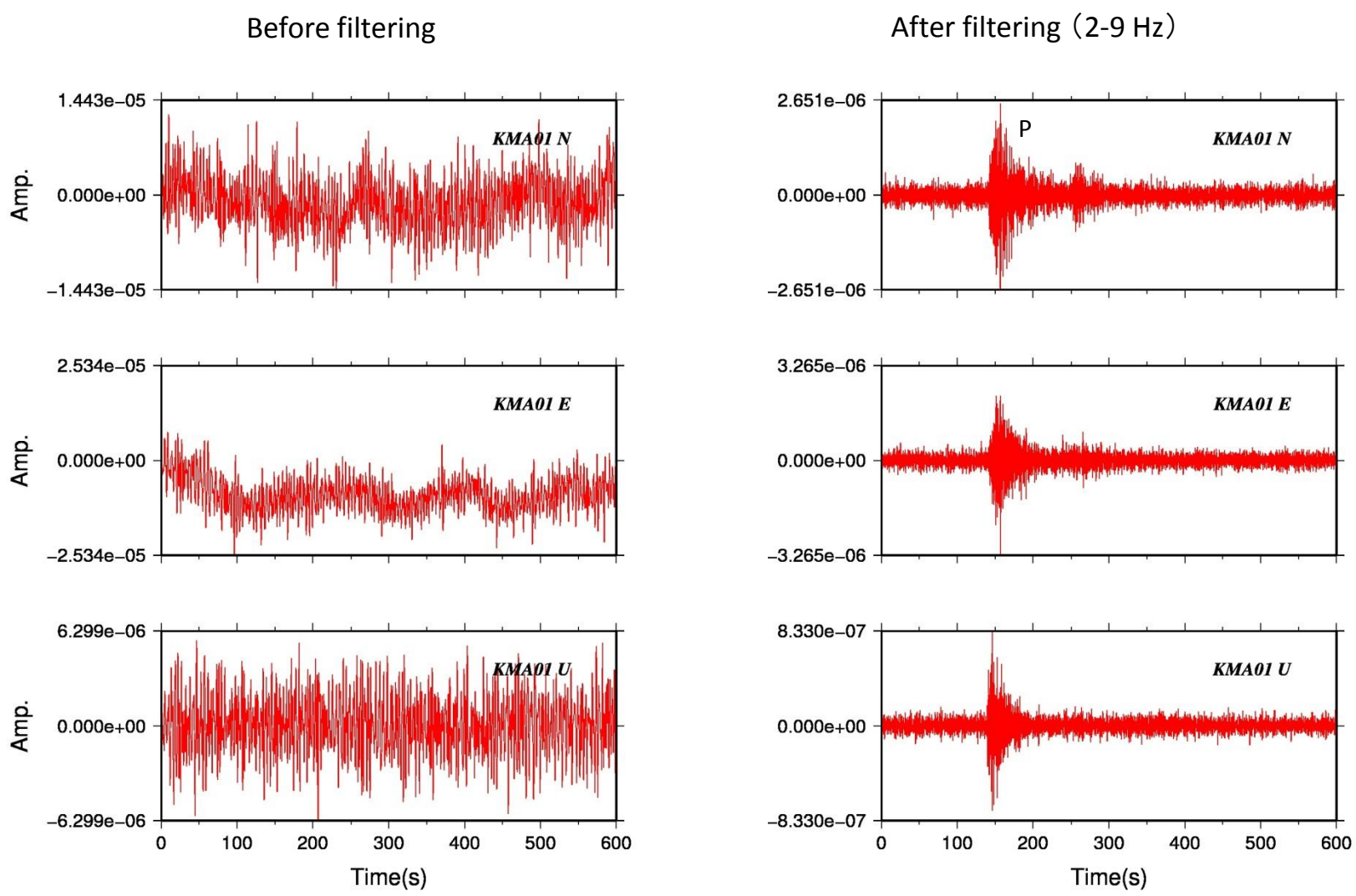
KMA01 broadband seismograph vertical component

velocity

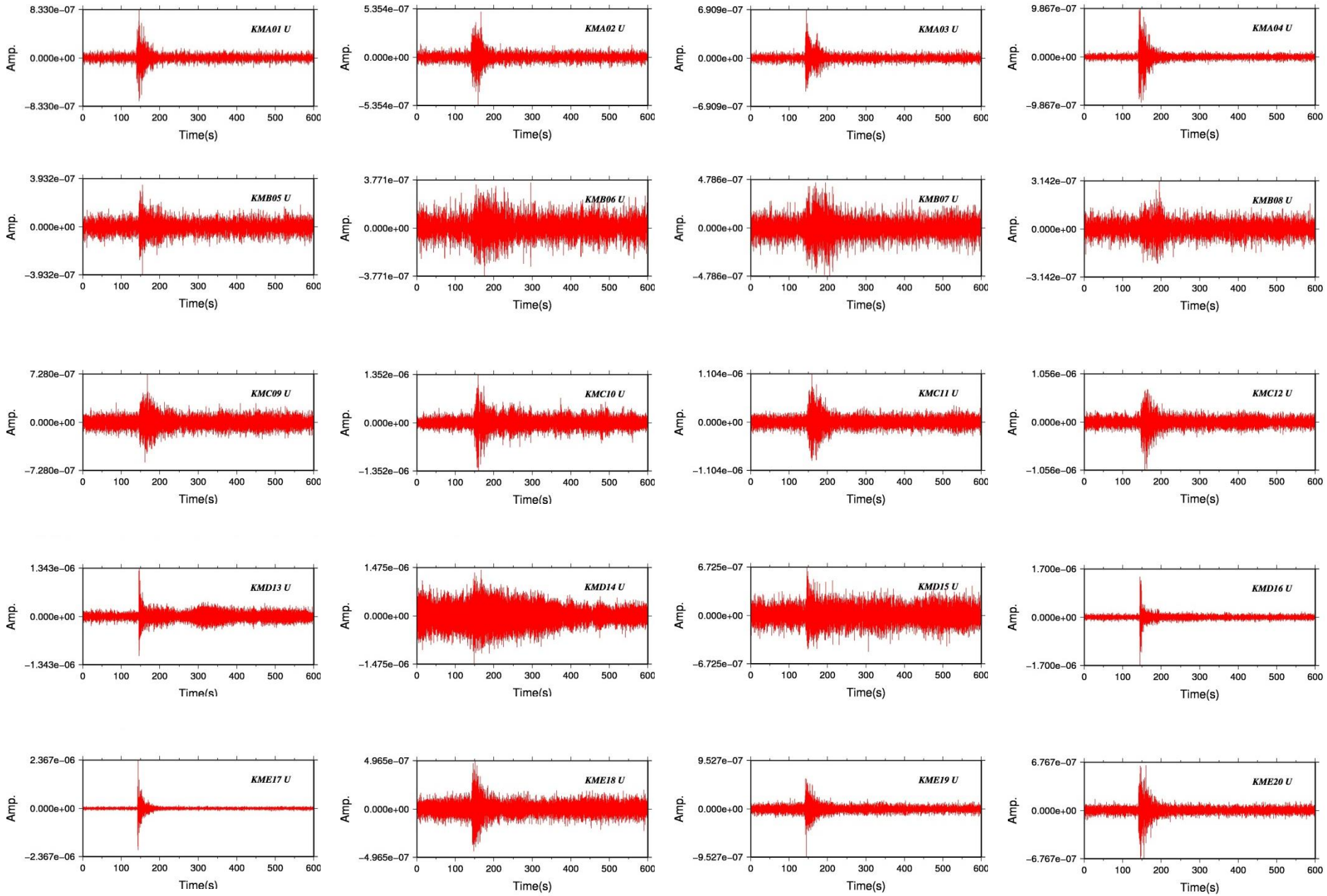
spectrum



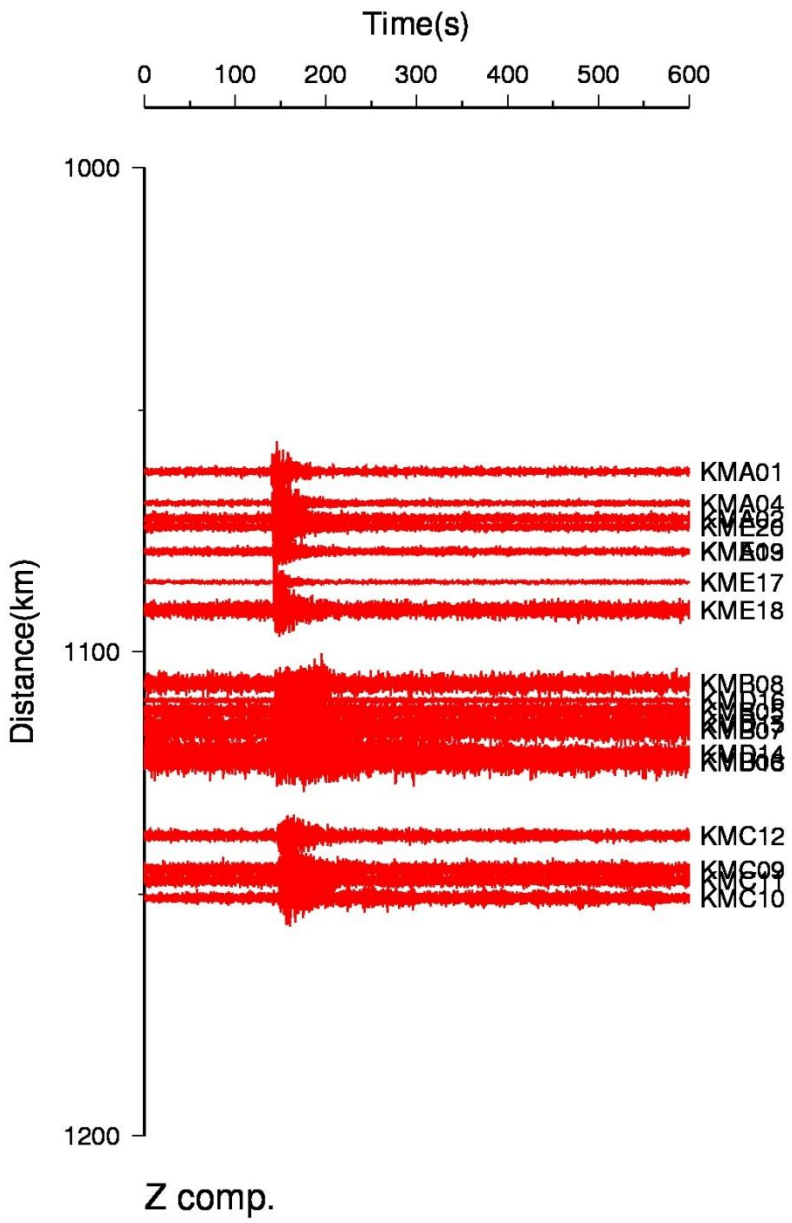
Broadband seismograph 3-components at KMA01



Vertical component broadband seismograph
2-9 Hz bandpass filter is applied



Verical componet of broadband seismograph
2-9 Hz bandpass filter is applied



DONET, DONET2, and DONET3