The new strong-motion seismograph of the K-NET

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Introduction

National Research Institute for Disaster Prevention (NIED) operate the K-NET, a strong-motion observation network which covers the whole Japan homogeneously at intervals of an average of 25km. We report the outline of the new strong-motion seismograph which was developed for the K-NET.

Outline of the new strong-motion seismograph

A new strong-motion seismograph (K-NET02) is consists of three modules of a sensor module, a measurement module, and a communications module. It connects with a data center through an ISDN line. The main features of a new strong-motion seismograph are functions for processing JMA seismic intensity and near real time data communications.

Although the strong-motion seismograph currently used (K-NET95) does not calculates seismic intensity, a new strong-motion seismograph functions as a formal seismic intensity meter which suited the official approval of the Japan Meteorological Agency. If a new strong-motion seismograph detects a strong-motion, it will communicate with a data center automatically in dozens of seconds. Furthermore, the full-scale was improved from 2000gals to 4000gals. The dynamic range of an AD conversion is 132dB. Since it is programmable, the contents of processing of a measurement module and a communications module have various functions, such as accumulation of continuous data, and are flexibly easy to extend.

Difference in records of old and new strong-motion seismograph

With change of the full-scale, a scale factor changes by the old and new strong-motion seismograph. Since the scale factor is specified in the header of data, users should refer to this for analysis. Moreover, the anti-alias filter was changed into the FIR filter with a cutoff frequency of 30Hz from the IIR filter of the Butterworth characteristic. Some difference may arise in record length by the difference in trigger algorithm.