

SSS024-02

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The variation recorded by waveform images of the F-net at the 2007 Niigataken Chuetsu-oki EQ - 1: Daily plot

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1. Preface

The F-net Broadband Seismograph Network, which is composed of around 100 STS-1 and -2 seismometers, is the network for monitoring earthquakes. Their records are open to the public through its homepage⁽¹⁾.

The homepage provides waveform images (daily plot) in addition to digital data of the waveforms. The purpose of the waveform images could be to help determination of period for waveform data, but they can also be data of seismicity. Because the daily plot is a GIF format image, and whose size (unit: KB, Kilo byte) relates to total length of the drawn lines, further relates to total amount of vibration of the ground where the seismometer is installed. The mathematical explanation of the so far mentioned is shown below, where the symbol => shall mean existence of relationship between the two in this document.

Size of F-net waveform image (KB, Kilo byte)

=> Total length of the drawn lines

=> Total amount of vibration of the ground

The size of the image is summation of drawn lines for specified period, thus it is different from waveform, which is an instant value. The elements which affect its size are amplitude (velocity), frequency and duration of vibration, and it seems that amplitude and duration of vibration affect the value very much.

2. Analyses

2.1 There are several analyses already conducted^{(2),(3)}.

2.2 2007 Niigataken Chuetsu-oki Earthquake

<Method>

Total of 10 stations surrounding Kashiwazaki, where is the place of the epicenter, are investigated for the period from May 1, 2007 to July 31, 2007. Directions of the investigated vibrations are East-West and Up-Down.

<Results>

* The all measurements show variation during the period in a similar way.

* Among them, only Kashiwazaki station (Code KZK) shows very large fluctuation for short periods. Those periods are each several days around 50 and 30 days before the EQ. The latter could be of earth tides' effect.

* The author investigated if weather and sea conditions as well as human activities affected the measurements, but there were no significant such effects to the measurements, thus it can be concluded that the observed variations are results of tectonic activities near epicenter of the EQ.

Gratitude

The author thanks to National Research Institute for Earth Science and Disaster Prevention (NIED) for the use of F-net data.

References

(1) F-net home page, <http://www.fnet.bosai.go.jp/top.php?LANG=en>.

(2) Yoshiki Sue, 2010, Long-period vibration recorded by waveform images of the F-net Broadband Seismograph Network, Part 1(In Japanese), SSJ Fall meeting abstract D31-12.

(3) Yoshiki Sue, 2010, Long-period vibration recorded by waveform images of the F-net Broadband Seismograph Network, Part 2(In Japanese), SSJ Fall meeting abstract P3-60.

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