

The increase in missing waveform images of the F-net broadband seismograph network preceding the 2011 Tohoku earthquake (2)

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1. none

1. Introduction

For the themed earthquake, it is reported that number of the stations with missing waveform images (i.e. data) in the broadband seismic network F-net increased over several months before and after the main shock.

There was the first increase from December 22, 2010 to January 18, 2011, and reached the number of 4. Then there was the 2nd increase from February 16, 2011 to March 2, 2011. Especially from February 19 to March 2, it again became 4 stations (Sapporo (Code: HSS), Yamagata (IYG, Iwate pref.), Kesenuma (KSN) and Shiramine (SRN)). ... The period of 2nd increase overlapped seismically active period of February 13 to March 2 when M5 earthquakes occurred continuously in the epicentral region. (Sue, 2013)

2. Further investigations

We conducted further investigations for the period from the middle of February 2011 to the beginning of March 2011 and obtained the following results.

<Slow slip>

·Slow slip occurred near the epicenter before occurrence of the main shock. Slow slip began on January 29, 2011, expanded the active area around February 19, existed till the time just before occurrence of the Off Sanriku earthquake M7.3 on March 9. The slow slip induced the earthquake, which is thought the foreshock. (Uchida, Kato, Ito, Ota, 2014)

<Missing data of F-net>

·The second deterioration started from February 16, 2011, and from February 19 to March 2, it became the worst condition with 4 data-missing stations (Sapporo (HSS), Iwate Yamagata (IYG), Kesenuma (KSN), and Shiramine (SRN)).

·Sapporo (HSS) and Iwate Yamagata (IYG) were the stations with missing data before starting of deterioration.

·Kesenuma station (KSN) joined this group from February 16 to March 2.

·Shiramine station (SRN) joined this group from February 19 to April 25. Shiramine station is located in Hakusan city, Ishikawa prefecture where is far from off-Sanriku area, but on February 27, there was an earthquake swarm including a M5.5 Earthquake in Hida area near the station.

·The increase of data-missing stations ended on March 2, then number decreased. On March 8, the day before occurrence of the foreshock with a magnitude of 7.3, two stations; Iwate Yamagata (IYG) and Shiramine (SRN) remained.

3. Summary

Increase of missing data for the F-net stations from mid February to early March coincides the slow slip which occurred from January 29 through March 9 as well as the earthquake activities in off-Sanriku region from mid-February to late February in terms of time and location. On February 19, slow slip expanded the area, and on the same day, it reached the largest number of missing stations of F-net. It is thought that F-net responded to some kind of vibration generated near the future epicentral region.

Acknowledgement

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References

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