

O020-P27

会場: 国際会議室 日時: 5月22日 13:45-15:15

Earthquakes: Why some places shake more than others

#Miyu Kumazawa

【Yokohama Municipal Yokohama Science Frontier High School】

Text :

1. Purpose

I knew the fact that there are places that shake more than other places at Science literacy class last year. And then I wanted to know the reason so I studied it.

In Japan, many large earthquakes hit many times in past and the damage was so serious. We should know more about earthquakes because we must reduce the damage.

2. Way of Research

(1) Choosing earthquakes for my research

There are 481 records of earthquakes in Yokohama from 1996 to 2010. I chose 15 that are the largest earthquakes and most of these hypocenters are not in Yokohama. I used a software that analyzes the wave of the earthquake (smda2).

(2) avs20(km/s)

An avs20(km/s) is a speed of secondary wave at 20 meters depth. All the places I chose have an avs20, so I compared seismic intensity of the places. I made a graph about these relations.

The vertical line shows the seismic intensity and the horizontal axis shows the avs20(km/s). These dots show each observation place and I wrote an approximation curve. [Fig.1]

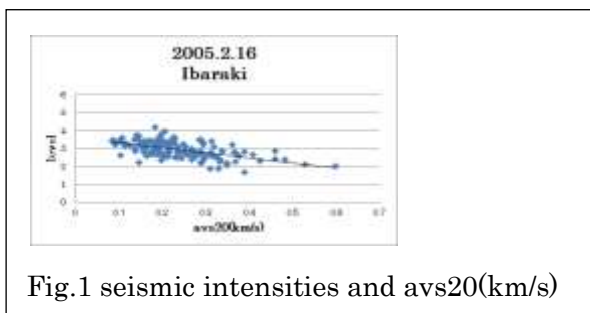


Fig.1 seismic intensities and avs20(km/s)

(3) N value

I got these N values for each place from the web page of city Yokohama (Jiban view).

N value shows how hard each area's ground is, and the harder the ground is, the larger the value is.

I found out in each area, depth the N value becomes more than 50 at a certain. In short, if there is a point with a deeper position, the ground of the place is soft. [Fig.2]

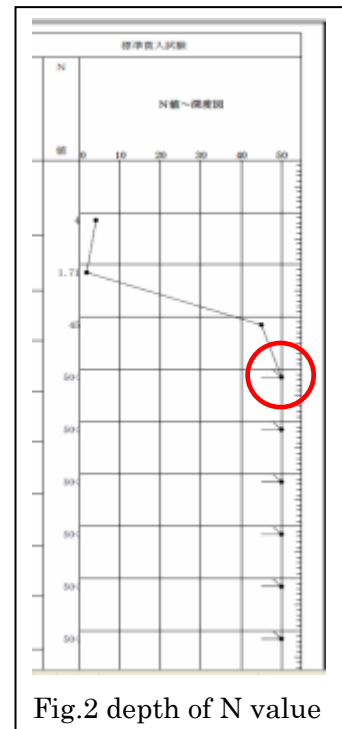


Fig.2 depth of N value

3. Result

(1) v_{s20} (km/s)

All graphs about seismic intensity and v_{s20} (km/s) show this fact. The slower the speed of the secondary wave is, the larger the seismic intensity is.

(2) N value

The deeper the depth where the N value becomes more than 50 is, the larger the seismic intensity is.

In short, the softer the ground is, the larger the seismic intensity is.

4. Conclusion

We can guess how hard each ground of city Yokohama. If the place shakes much, the speed of secondary wave is slower and the ground is softer than other places. And when we use this fact, we can guess how large the seismic intensity will be not only in Yokohama but also out of Yokohama.

By using this fact, so we will be able to guess the size of shaking and therefore reduce the damage.