Focal depth determination using the travel time differences of S and ScS to improve the accuracy of tsunami forecast.

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Tsunami generationg is expected when the shallow big earthquake occurs in ocean space. Since the usual tsunami generating is associated with the ocean bottom change by the earthquake occurrence, the scale becomes large as an earthquake magnitude and the focus becomes large and shollow. Therefore,it is required for the improvement in accuracy of a tsunami forcast that the focal depth should be determined correctly.

The accuracy of an epicenter and the depth improved about the earthquake which occurs in the inland of Japan today when the high sensitivity and high density seismic observation network were deployed. The depth accuracy is not necessarily high, however, about the earthquake that occurs in ocean space which need the issue of a tsunami forcast, since it comes out of the network.

So far, the travel time analysis of the reflective wave in the earth surface and the sea surface which are called as the depth phase has been used as a mean to determine the depth of the focus correctly. The application of travel time analysis becomes difficult, in the earthquake with which are filled the conditions to generate large-scale tsunami when the occurence become large and shallow, since the reflective phase will be covered by the parent phase itself and the coda waves, and also the scale of that amplitude generally becomes small.

In record beyond periodic 40 seconds of a broadband seismograph, S and ScS wave have appeared clearly at most big scale earthquake occurrences. Although it is difficult to detect the absolute arrival time of both phases in this frequency correctly, a relative time difference can be searched for with sufficient accuracy, since the waveform correlation is very high. We tried to determine the depth of a big earthquake correctly by using the relative time difference, since the travel time difference of S and ScS wave is specified to the depth of the focus and epicentral distance.

The exact depth data of the forcus determined by using this technique can be combined with the focus determination(Fyrudate,2003) data based on the grid searching method using the LISS(Live Internet Seismic Server) data of USGS developed until now, and can aim at the important in accuracy of a far coast tsunami forcast.

Although the arrival time of ScS wave is difficult to use for the 1st issue of the tsunami forcast by the earthquake which occurs in near coast line, it having to wait for the time progress around about 900 seconds from the occurrence of an earthquake, it becomes the important data which is used to correct and cancel the issued forcast.