Japan Geoscience Union Meeting 2015
(May 24th - 28th at Makuhari, Chiba, Japan)

SSS26-16 Room:103 Time:May 26 15:15-15:30

Amplitudes of sP depth phase observed at small epicentral distances from offshore events in the northeastern Japan

KOSUGA, Masahiro[1*] ; KATO, So[1]

[1]Grad. Sch. Sci. & Tech., Hirosaki Univ.

Travel times of sP phase have been widely used to improve depth accuracy of earthquakes for both far- and near-field observations. However, the amplitudes of sP phase has not been paid much attention probably because the amplitudes may depend on many parameters. Here we developed an automated technique to detect sP phase and measure its amplitude to search for future use of amplitude data. The method consists of the picking of possible arrival times for each station, screening data through depth relocation, and amplitude correction. The first step picks possible pairs of arrival times and amplitudes in the time windows that satisfy the criteria of polarization characteristics. The combined data from all stations are organized into several groups based on the relation between sP-P times and epicentral distance. The screening process selects the best group that gives the least travel time residuals from the event depth revised by sP-P times. Finally, the amplitudes are corrected for the dependence on epicentral distance. We applied the method to a data set from offshore earthquakes of the northeastern Japan. The amplitudes plotted on focal sphere are partly consistent with the CMT solution. The spatial distribution of amplitudes plotted at reflection points show complex pattern that suggest no significant correlation with the submarine topography. Thus the amplitude of sP phase probably reflects source radiation, together with some additional factors such as spatial heterogeneities of reflectivity. This result suggests potential use of sP amplitude to constrain the focal mechanisms of offshore earthquakes.

Keywords: sP wave, reflection, amplitude, focal mechanisms