The correction for the estimation of epicentral distance by incident angle observed at a single station

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http://www.j-map.bosai.go.jp/j-map/

We present a new method of estimating the epicentral distance by using incident angle observed at a single station for short time after the P-wave arrival. Tsukada *et al.*(2002) and Odaka *et al.*(2003) introduced a simple function with the form of Bte^{-At} and determined A and B by fitting this function to the initial part of the waveform envelope. They showed that *logB* is in inverse proportion to the logarithm of epicentral distance. This method is named B-delta method, which is used in the earthquake early information provided from the Japan Meteorological Agency.

Tsukada *et al.*(2004) pointed out that the parameter B is influenced on anelasticity of the medium, scattering and geometrical spreading of P waves during propagation. So the parameter B is expected that related to the distance considering both epicentral distance and depth rather than only the former. Actually, the epicentral distance of the closest station tends to be overestimated in case of deep earthquakes.

In this study, we introduce the term of the incident angle related to both the epicentral distance and depth to the B-delta method so as to estimate more reliable epicentral distance at the closest station. We apply the new method to the strong motion data observed at the KiK-net of the National Research Institute for Earth Science and Disaster Prevention (NIED).