

SSS016-10

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## Evaluation of the depth time to basement from surface estimated by means of non-stationary ray decomposition

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### Introduction

A new method to estimate the velocity boundaries of real layered structure from only surface recordings is constructed by decomposing an SH-wave into instantaneous power of shearing strain associated with rays in a homogeneous half space. We conducted the evaluation for the estimated results obtained by applying the proposed method to the strong motion data recorded at the FCH array.

### Data

Surface recordings at the FCH array sites were used. The recordings which were obtained by velocity seismometers for the earthquakes that occurred in the Central Chiba, the Eastern Yamanashi, the Southwestern Ibaraki, Tokyo prefecture and East off Izu peninsula regions. The data were obtained for the events with JMA magnitude of more than 4.

### Method

Non-stationary ray decomposition method is applied to the transverse component data of direct S-wave. The data are converted to analytic signals, and then the signals are used to estimate the instantaneous power by means of Wigner-Ville distribution.

### Results

This study yielded the following results:

- 1) For each source region, the errors of depth time from the surface to the top of basement were within 0.1 seconds, which were nearly equivalent to 0.1km.
- 2) Estimated depth time from surface to basement depends on source regions. This is due to the regional difference of sedimentary layer-basement system.
- 3) For the earthquakes that occurred in the Eastern Yamanashi region, the pulse sequence of total reflection of SH-wave can be recorded because the top of basement is inclined about 6 degrees from this source area to the Fuchu array. The depth time estimated by each reflected pulse follows the thickness of the deposit layer at the reflected point.

### Acknowledgement

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