

The 2002 seismic exploration in the Kozu-Matsuda fault zone and Ashigara valley

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To investigate the underground structure in the Kozu-Matsuda fault zone and Ashigara valley, which will be used for strong motion

prediction in the Tokyo metropolitan area, a seismic refraction survey was conducted in February and March, 2002 with the support of the Earthquake Prediction Research Council. Explosions were fired at four shot points surrounding the Ashigara valley. Seismic ground motions from them were observed by a research group of strong motion seismologists using portable recorders deployed along survey lines connecting the shot points or distributed in the Ashigara valley. In addition, the department of disaster mitigation, the prefectural government of Kanagawa carried out reflection surveys along a east-west line over the Kozu-Matsuda fault zone and a north-south line in the Ashigara valley. The explosions were also observed by receivers along these reflection lines.

We present the results of refraction analyses, in particular, the P-wave velocity structure along the east-west lines of the refraction and reflection surveys. According to these analyses, the P-wave velocity of the basement in the uppermost crust is found to be 4.3 - 4.5km/s. The sediments in the Ashigara valley consists of a lower layer of about 3km/s and an upper layer of about 2km/s. The maximum thicknesses of these sedimentary layers appear under the Sakawa river. They become small to the Kozu-Matsuda fault zone in the east of the Ashigara valley. The upper layer almost disappears under the Oiso hills, but again appears in the farther east, where the central basin of Kanagawa is located.

We find that various seismic waves were generated by the Kozu-Matsuda fault zone. Reflected waves laterally traveled from the

fault zone, and multi-pathing can be found in the refracted waves. We compare their observations with simulated seismograms considering the effect of the fault geometry. We also perform a three-dimensional inversion of traveltime data observed by the recorders in the valley. We will present the results of these additional analyses.