Improvement of crustal imaging by the new technique, skeletonization, for seismic reflector recognition

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The seismic reflection method is a basic tool to image the Earth interior structure in various scales from sedimentary basins for petroleum exploration to the upper mantle for scientific targets. However, further development of the method is now necessary in order to detect and recognize essential reflectors from artificial patterns and/or noise. One of new pattern recognition techniques is the seismic skeletonization, which is the extraction of the coherent reflection patterns from seismic profiles (Li et al., 1997).
And this technique is also available to apply to segment migration processing, then provides much higher resolution than the conventional wave pattern conversion migration. Thus, we introduce here the seismic skeletonization as a new pattern recognition technique, and try to apply it to the field data of "Itoigawa-Shizuoka tectonic Line Project" acquired from 2002 to 2008 by the University of Tokyo. As a result, we have successfully improved the former noisy profiles processed by the conventional technique, and obtained excellent ones in higher quality by the seismic skeletonization.

Keywords: seismic reflection survey, Itoigawa-Shizuoka tectonic line, pattern recognition technique, skeletonization, common reflection surface method