

日本列島下のP波とS波減衰トモグラフィー

P and S wave attenuation tomography of the Japan subduction zone

*趙 大鵬¹、Wang Zewei¹、Liu Xin¹、Chen Chuanxu¹*Dapeng Zhao¹, Zewei Wang¹, Xin Liu¹, Chuanxu Chen¹

1. 東北大学大学院理学研究科附属地震・噴火予知研究観測センター

1. Department of Geophysics, Tohoku University

The first high-resolution P and S wave attenuation (Q) tomography beneath the entire Japan Islands is determined using a large number of high-quality data collected from P and S wave velocity spectra of 4222 local shallow and intermediate-depth earthquakes. The suboceanic earthquakes used in this study are relocated precisely using sP depth phases. Significant landward-dipping high- Q zones are revealed clearly, which reflect the subducting Pacific slab beneath Hokkaido and Tohoku, and the subducting Philippine Sea (PHS) slab beneath SW Japan. Prominent low- Q zones are visible in the crust and mantle wedge beneath the active arc volcanoes in Hokkaido, Tohoku and Kyushu, which reflect source zones of arc magmatism caused by fluids from the slab dehydration and corner flow in the mantle wedge. Our results also show that non-volcanic low-frequency earthquakes (LFEs) in SW Japan mainly occur in the transition zone between a narrow low- Q belt and its adjacent high- Q zones right above the flat segment of the PHS slab. This feature suggests that the non-volcanic LFEs are caused by not only fluid-affected slab interface but also specific conditions such as high pore pressure which is influenced by the overriding plate.

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