

Seismic attenuation in the mantle beneath the Ontong Java Plateau from multiple ScS waves

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We determined shear attenuation of the mantle (Q_{scs}) beneath the Ontong Java Plateau (OJP) using multiple ScS waves recorded at broadband seismic stations on the seafloor and lands in the OJP region and its vicinity. We analyzed seismic records from the 500 km-deep earthquake beneath the New Ireland region on August 30, 2016, which was only an event that enabled Q_{scs} measurements at the stations. The multiple ScS waves traveled the mantle beneath the northern and central parts of the OJP and the region in the west of the OJP, while the waves traveling the mantle beneath the southern half of the OJP were too small to be analyzed. Q_{scs} values from the multiple ScS waves traveling beneath the northern part of the OJP were scattered from 100 to 300. Q_{scs} values obtained from ScS waves traveling outside the OJP mantle were less than 100, lower than those beneath the northern part of the OJP. The Q_{scs} beneath the northern part of the OJP was not significantly different from Q_{scs} values reported by previous studies beneath the Pacific Ocean (130-300), suggesting no significant difference in mantle temperatures beneath the northern OJP and other parts of the Pacific Ocean. A Q_{scs} value for ScS waves traveling the central part of the OJP and Nauru basin (east to the OJP) was lower than 100, which may be attributed to high temperature anomalies and/or melt in the LLSVP beneath the Nauru basin.

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