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Crustal and upper mantle velocity structure beneath the King George Island using a joint inversion of receiver functions and surface wave dispersion curves

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The seismic velocity structure of the crust and upper mantle beneath the western parts of King George Island has been investigated by jointly inverting receiver functions and Rayleigh and Love wave group velocities to obtain new constraints on the thermal structure of the lithosphere. Teleseismic waveform data for this study were obtained from three broadband seismic station: KSJ, FREI, and JUBN. Shear velocity models obtained from the joint inversion show crustal structure that is similar to previously publishe models, with crustal thicknesses of 25−30 km. All of the velocity models inverted from the events coming from N and NW have a low velocity zone in deeper depths than one in the models inverted with the events coming from SW. Results from 1D models and piercing points of each rays indicates that the deeper low velocity zone in the models from N and NW events might be caused by subducting oceanic plate, while the shallower low velocity zone in the models from SW events might be due to partial melting beneath the rift zone in Bransfield Strait.

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