


AGU Fall Meeting 2009

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ID# DI13A-1634

Location: Poster Hall (Moscone South)

Time of Presentation: Dec 14 1:40 PM - 6:00 PM

Joint Receiver Function - ScS Reverberation Analysis Examining Discontinuity Structure Beneath Ocean Islands

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Many of the individual methods used to study mantle discontinuity structure are subject to limitations of lateral resolution, dependency on seismic velocity models, or source-receiver geometry. These concerns are magnified beneath ocean islands, where limited station coverage and high noise increase the difficulty of interpreting discontinuity structure. In this study, we compare two methods commonly used to image mantle interfaces: teleseismic receiver functions and ScS reverberations. The ScS method benefits from the use of absolute travel times and therefore better constrains discontinuity depths, while receiver functions benefit from better event coverage and higher frequency resolution. We apply these methods to several permanent stations located in the Hawaiian Islands, and present a proof-of-concept for the joint application of the two techniques. First, ScS reverberations are used to assess mantle discontinuity depths and whole-mantle travel times. Based on this preliminary model, receiver functions are subsequently used to refine both lateral and vertical discontinuity structure. The results of the joint application of these techniques are discussed with implications for future studies.

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