



Interaction of sinking slab debris with D'' beneath South America

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Understanding the origin of structures in the lower mantle and D'' in particular is key to understanding how the Earth works as a global interconnected system. The role of subducted slabs involving the Circum-Pacific lower mantle high velocity belt proves particularly complicated with a mixture of phase-changes and up-welling zones. Here, we address such a complicated structure beneath South America by exploiting diffracted S-waveforms from a deep event beneath the South Sandwich Islands recorded by USArray. The upper mantle effects are removed by using a calibrated procedure provided by closer events. Our modeling results display a NS linear feature separating a fast slab and a prominent low-velocity lumpy strip, about 250km wide, and over 1,000km long. The pile-like structure in cross-section is 50km high with a 2.5% decrease at the top and 5% decrease at the CMB. This is overlaid by a normal PPV structure. Such features are quite compatible with a weak iron-oxide mixture bulldozed by a sinking slab as suggested in some recent tomographic models.