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Thickness of the mantle transition zone beneath the Society hotspot

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We have conducted a seafloor geophysical observation from 2009 to 2010 near
the Society hotspot. The observation network was composed of nine sets of
broadband seismographs and electro-magnetometers, and two differential pressure gauges. In this presentation we show the mantle transition zone (MTZ) structure obtained with a receiver function method using the broadband seismograms. We employed a common-conversion point (CCP) stacking technique to map the MTZ thickness. A preliminary result indicates an area of a thin MTZ 200 km to the south of the Society hotspot (thinner than global average by 20-30 km). The lateral dimension of the thin MTZ area is about 200 km. There is another area of the thin MTZ 300 km EES to the hotspot. The thin MTZ areas are roughly correlated with slow P-velocities in the MTZ in the P-wave tomograms (Obayashi et al., 2014). They may represent hot mantle plumes ascending from the lower mantle.

Keywords: hotspot, ocean bottom seismograph, receiver function, French Polynesia