

**ABSTRACT FINAL ID:** T43K-06;

**TITLE:** Mantle Heterogeneity and Off Axis Volcanism on Young Pacific Lithosphere

**SESSION TYPE:** Oral

**SESSION TITLE:** T43K. The Origin of Intraplate Volcanism: Hotspots, Nonhotspots, and Large Igneous Provinces I

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**ABSTRACT BODY:** Plate tectonics and mantle plumes explain most volcanism on earth, but there are numerous actively forming linear volcanic chains in the middle of tectonic plates that are not explained by these theories. Using the multidisciplinary geophysical dataset of the MELT and GLIMPSE experiments, we show that associated with 3 volcanic chains west of the East Pacific Rise there are low seismic velocities and densities in the asthenosphere that extend to the East Pacific Rise spreading center. Analogous to the Hawaiian swell, the low-density anomalies produce swells beneath the volcanoes on young seafloor. The associated gravity anomalies are part of a set of gravity lineaments that have been previously interpreted as being due to thermo-elastic cracking of the lithosphere or small-scale convection. The correlation between the surface volcanism and subsurface density and velocity anomalies and their extension to the spreading center suggest that pre-existing, buoyant or fertile asthenospheric mantle heterogeneities are stretched in the direction of plate motion by shear between the plate and the underlying mantle. These heterogeneities seed small-scale convection, producing upwelling and pressure release melting, forming volcanic chains that extend nearly to the ridge axis.

**KEYWORDS:** [1219] GEODESY AND GRAVITY / Gravity anomalies and Earth structure, [7208] SEISMOLOGY / Mantle, [7255] SEISMOLOGY / Surface waves and free oscillations, [3037] MARINE GEOLOGY AND GEOPHYSICS / Oceanic hotspots and intraplate volcanism.

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