



Long-range Receiver Function Profile of Crustal and Mantle Discontinuities From the Aleutian Arc to Tierra del Fuego

Kathrin Spieker, Stéphane Rondenay, and Lucas Sawade

University of Bergen, Department of Earth Science, Bergen, Norway (kathrin.spieker@uib.no)

The Circum-Pacific belt, also called the Pacific Ring of Fire, is the most seismically active region on Earth. Multiple plate boundaries form a zone characterized by frequent volcanic eruptions and seismicity. While convergent plate boundaries such as the Peru-Chile trench dominate the Circum-Pacific belt, divergent and transform boundaries are present as well. The eastern section of the Circum-Pacific belt extends from the Aleutian arc, through the Cascadia subduction zone, San Andreas Fault, middle America trench and the Andean margin down to Tierra del Fuego. Due to the significant hazards posed by this tectonic activity, the region has been densely instrumented by thousands of seismic stations deployed across fifteen countries, over a distance of more than 15000 km. Various seismological studies, including receiver function analyses, have been carried out to investigate the crustal and mantle structure beneath local segments of the eastern Circum-Pacific belt (i.e. at ~ 100 -500 km scale). However, to the best of our knowledge, no study to date has ever attempted to combine all available seismic data from the eastern Circum-Pacific belt to generate a continuous profile of seismic discontinuities extending from the Aleutians to Tierra del Fuego. Here, we use results from the “Global Imaging using Earthquake Records” (GLImER) P-wave receiver function database to create a long-range profile of crustal and upper mantle discontinuities across the entire eastern portion of the Circum-Pacific belt. We image intermittent crustal and mantle discontinuities along the profile, and examine them with regard to their behaviour and properties across transitions between different tectonic regimes.