[EE] Evening Poster | S (Solid Earth Sciences) | S-IT Science of the Earth's Interior & Tectonophysics

## [S-IT28]The lithosphere and the asthenosphere

convener:Catherine Rychert(University of Southampton), Hitoshi Kawakatsu(Earthquake Research Institute, University of Tokyo), Samer Naif(共同), Jessica M Warren (University of Delaware)

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The lithosphere-asthenosphere boundary (LAB) separates Earth's rigid tectonic plates from the underlying convecting mantle. The LAB is fundamental to our understanding of plate tectonics and mantle dynamics, although its depth and defining mechanism are highly debated. How it varies among tectonic environments and its relationship to the Moho, MLD, and anisotropy are also poorly understood. Ocean bottom seismic data is particularly important for constraining the young plate with relatively simple history, although this data is difficult to attain and rare. We will focus on the lithosphere, the asthenosphere, and the lithosphere-asthenosphere system in a variety of settings including but not limited to continents, oceans, margins, rifts, ridges, hotspots, plumes, and subduction zones. We welcome research contributions from diverse fields, including but not limited to seismology, magnetotellurics, petrology/mineralogy, dynamical modelling, and mineral physics.

# [SIT28-P10]Preliminary study using harmonic decomposition of receiver functions to image non-isotropic characteristics of Japan subduction zone

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Conventional receiver function methods assume horizontal geometry and isotropy for velocity discontinuity analysis. However, in subduction zones, the isotropy assumption unlikely holds. In case of anisotropic velocity or dipping velocity discontinuity P-to-S receiver function show variation by back azimuth (Shiomi &Park, 2008). We employed the harmonic decomposition method (Bianchi et al. 2010, Agostinetti &Miller, 2014) to extract non-isotropic component from receiver functions to image the Pacific plate subduction under Japan. The harmonic decomposition gives five components (isotropic, cos(kθ), sin(kθ) terms for k=1, 2) from linear matrix inversion using radial and transverse receiver functions. The preliminary analysis using data from three Hi-net stations (ANIH, IHEH, KZMH) located along the 40N latitude with varying distance from trench shows following features: (1) Within first harmonics, the EW (sin(θ)) component is larger than the NS (cos(θ)) component at timing of the oceanic Moho phase. This well reproduces westward dipping of the Pacific slab. (2) In upper most crust (0-1 s), amplitude of k=2 harmonics is larger than k=1 harmonics, which implies large horizontal symmetric axis anisotropy. (3) Between continental Moho and top of subducting oceanic crust, large k=1 and k=2 harmonics are observed in mantle wedge . (4) Below subducting oceanic crust, both k=1 and k=2 harmonic components decrease consistently for all three stations, but locally large k=1 harmonics appear. Signature of previously reported hydrated mantle above subducting oceanic crust (Kawakatsu &Watada, 2007) is observed in station ANIH. At later positive peak, large amplitude of k=1 and k=2 harmonics is observed, which might indicate existence of dipping structure having horizontal symmetric anisotropy beneath. Our results show a possibility of applying the harmonic decomposition method to image non-isotropic component of subduction zones using receiver functions.