

P wave anisotropy caused by partial eclogitization of descending crust demonstrated by modeling effective petrophysical properties

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Check out the preprint of the manuscript here:

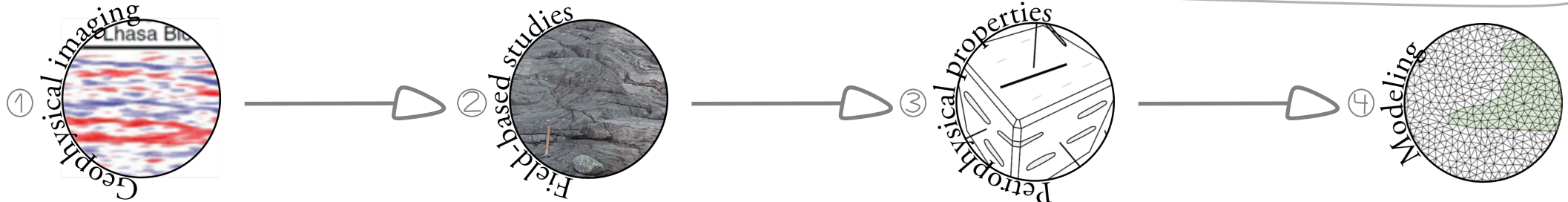
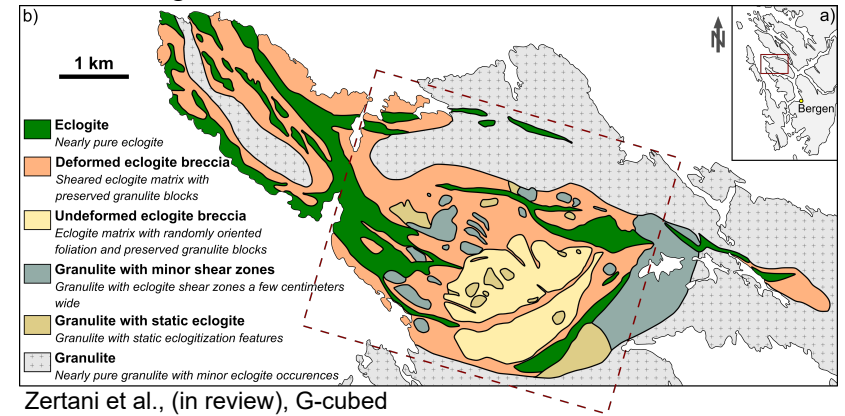
<https://doi.org/10.31223/osf.io/phybg>

① What evidence of eclogitization is present in geophysical images?

The signal of crustal material disappears progressively at depth (e.g., Rondenay et al., 2008).

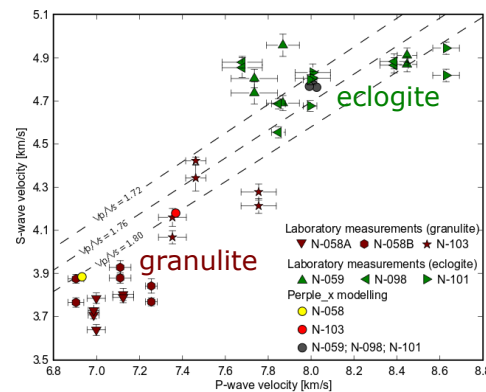
A backazimuthal dependence of the retrieved signal can be observed, for example, below the Himalaya (Nabelek et al., 2009).

② How does eclogitization of crustal material look in the field?

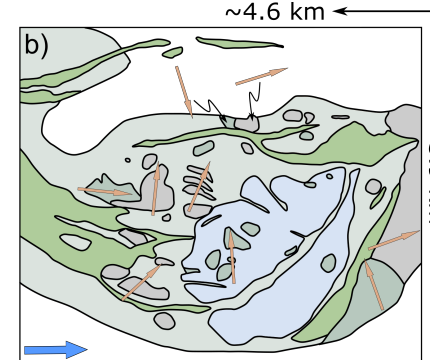


③ How do the petrophysical properties change during eclogitization?

1. Increased velocities
2. Increased anisotropy
3. Decreased V_P/V_S ratios



④ How do these properties vary across scales?



Modeling of effective properties using the *finite element method*.

Effective properties are *controlled by the properties of the constituting lithologies* not the meso-scale geometries.

Resulting P wave anisotropy of ~4% on the km-scale

Direction of fast axis

Direction of resulting fast axis