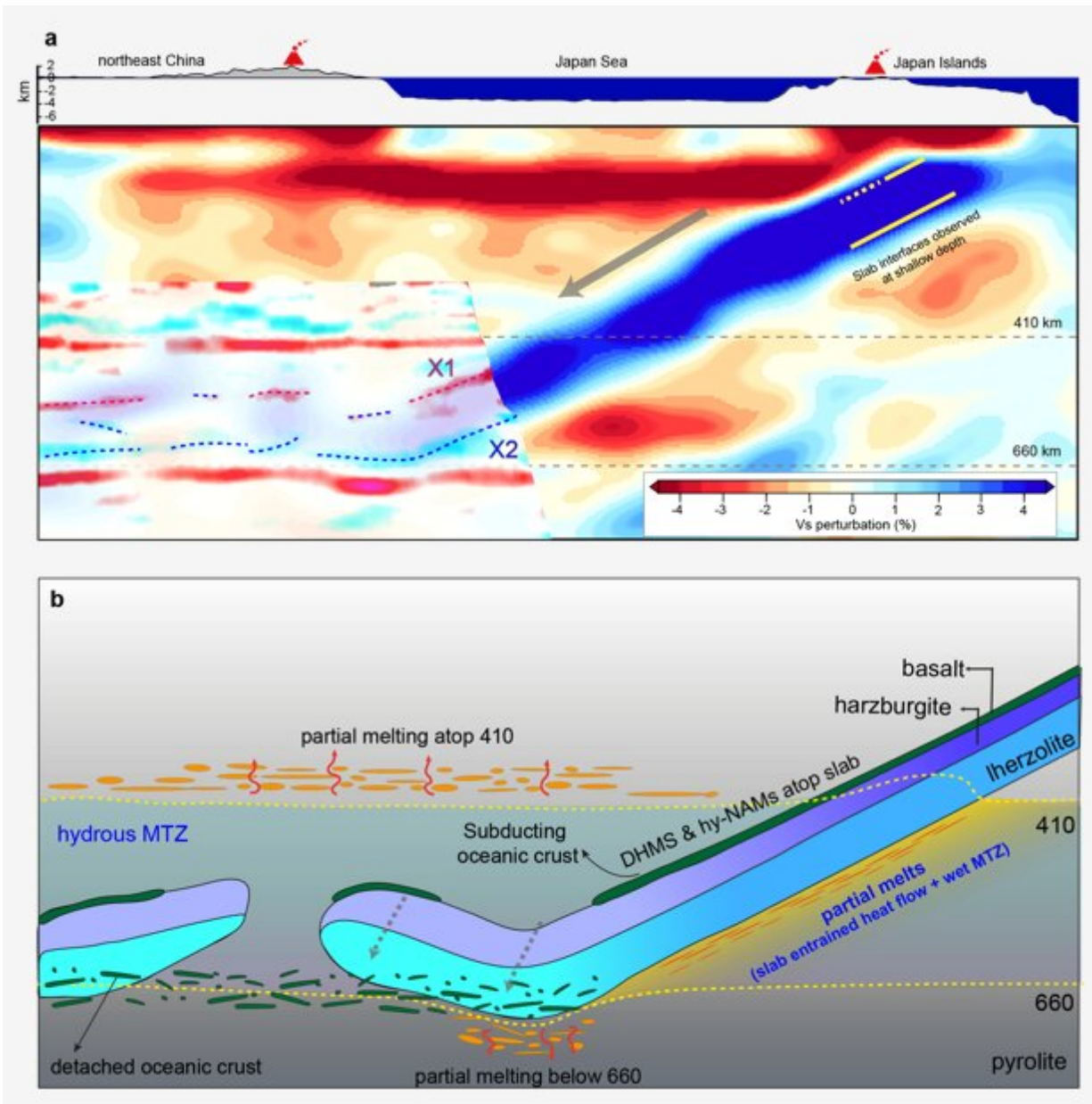


Distinct slab interfaces found within mantle transition zone

November 9 2020



Seismic observations (a) and a conceptual cartoon summarizing the origin of imaged slab interfaces (b). Credit: CHEN Qifu's group

The oceanic lithosphere descends into Earth's mantle as subducting slabs. Boundaries between the subducting slab and the surrounding mantle are defined as slab interfaces, whose seismic imaging is the key to understanding slab dynamics in the mantle. However, data on the existence of slab interfaces below 200 km remains elusive.

Prof. Chen Qifu's group from the Institute of Geology and Geophysics, Chinese Academy of Sciences (IGGCAS) and their [collaborators](#) observed two distinct seismic discontinuities within the mantle transition zone (~410 km to 660 km) beneath the western Pacific.

The two discontinuities represented the upper and lower boundaries of the subducted Pacific high-velocity slab, corresponding to the slab Moho and the surface of partially molten sub-slab asthenosphere, respectively.

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The subduction process transports chemically differentiated and hydrated rocks into Earth's mantle, driving the cycles of heat and material changes between Earth's surface and its deep interior.

At shallow depths (

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