



## **Mechanical separation of crust from slabs subducted below the transition zone**

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The mechanical separation of oceanic crust during subduction below the 660 km discontinuity has been suggested since the 1970's due to basaltic material being buoyant in the mantle at depths between 660 to 800 km. Analytical approaches have demonstrated that separation can happen through small-scale folding, but recent rheological studies of garnet show that it is weak enough to allow for viscous flow in and below the transition zone. Using 2D thermomechanical modelling it is shown that channel flow occurs in the oceanic crust for initial thicknesses between 7 and 12 km, and given slow sinking speeds of the slab, this causes a mechanical separation of the crust from the downgoing plate and the formation of garnet-rich structures in the uppermost lower mantle.