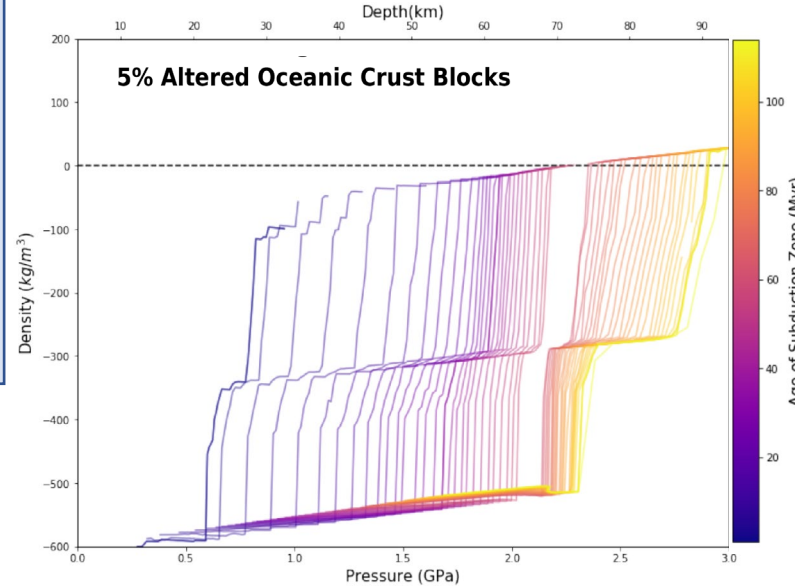


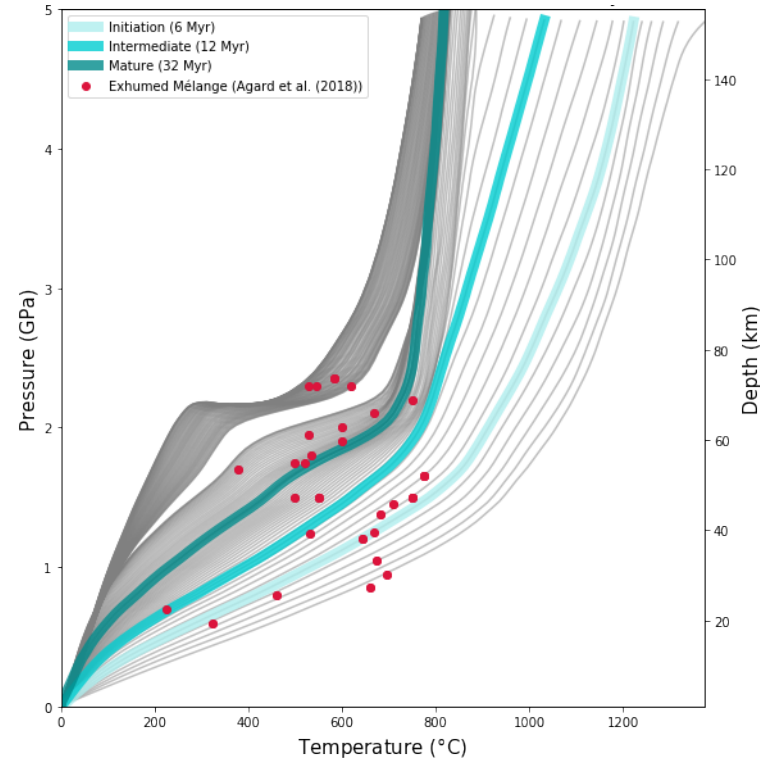
New dynamic models of subduction systems reveal significant variation in the PT conditions experienced by slab-top rocks from subduction initiation to maturity. This study analyzes temporal variation in the limits of buoyancy-driven exhumation of subducted materials, specifically through mélangé-type exhumation: mafic blocks derived from the slab rising along with the serpentinite-dominated plate interface.

Density Evolution of Mafic + Serpentinite Mélanges

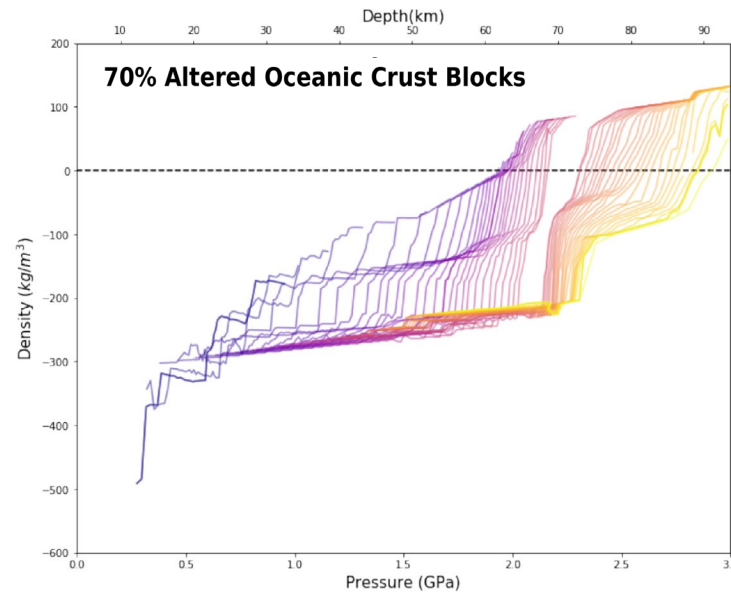


We observe significant variation in mélangé density with respect to the age of the subduction zone. The highest pressures recorded by these lithologies in the exhumed rock record fall at $<2.5\text{ GPa}$, where only mature ($>40\text{ Myr}$) subduction geotherms have positively buoyant rocks. Lawsonite breakdown and associated dehydration occurs at higher pressures and temperatures in more mature subduction zones. Further work will explore the potential role in dehydration embrittlement in causing slab blocks to enter the plate interface.

Evolution of Subduction Geotherm



70% Altered Oceanic Crust Blocks



Wt% H₂O in Altered Oceanic Crust

