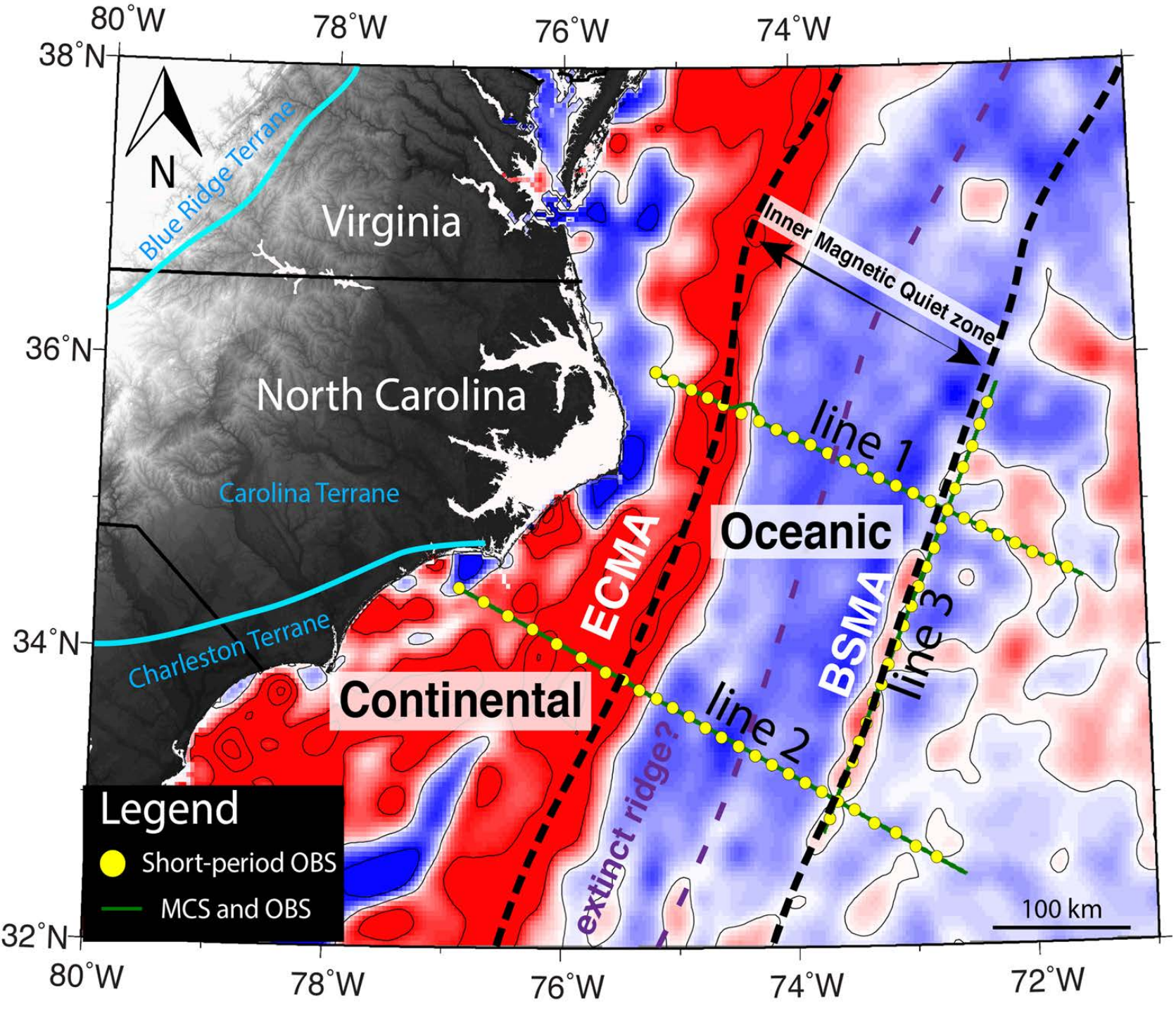

Brandon Shuck
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ENAM Workshop 2017

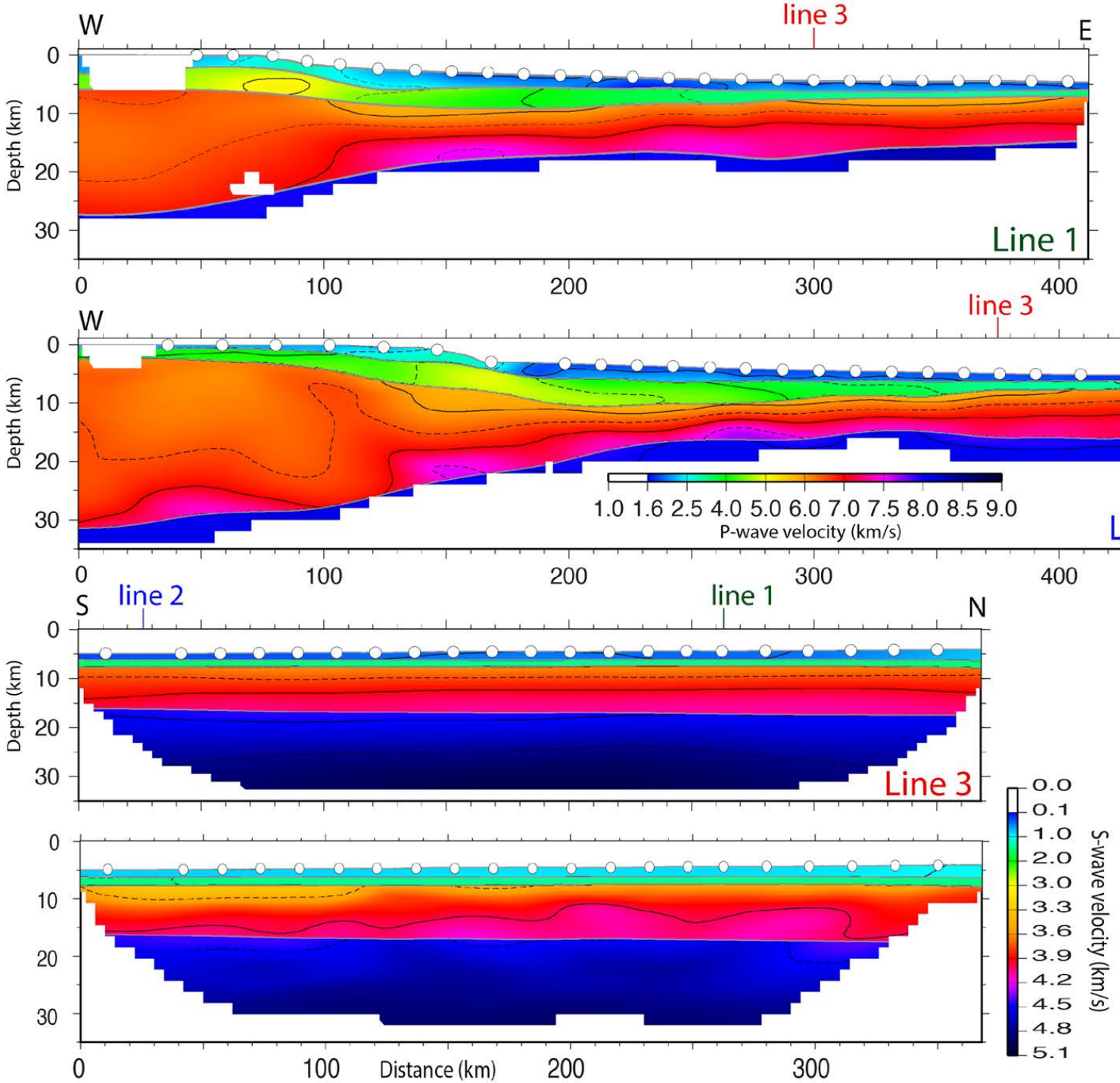
ENAM has typical expressions of a volcanic rifted margin

- SDR's
- High velocity lower crust
- ECMA – boundary of continental and oceanic regimes?

BSMA has no mirror counterpart on the African plate

Rift jump?

Asymmetric rifting?

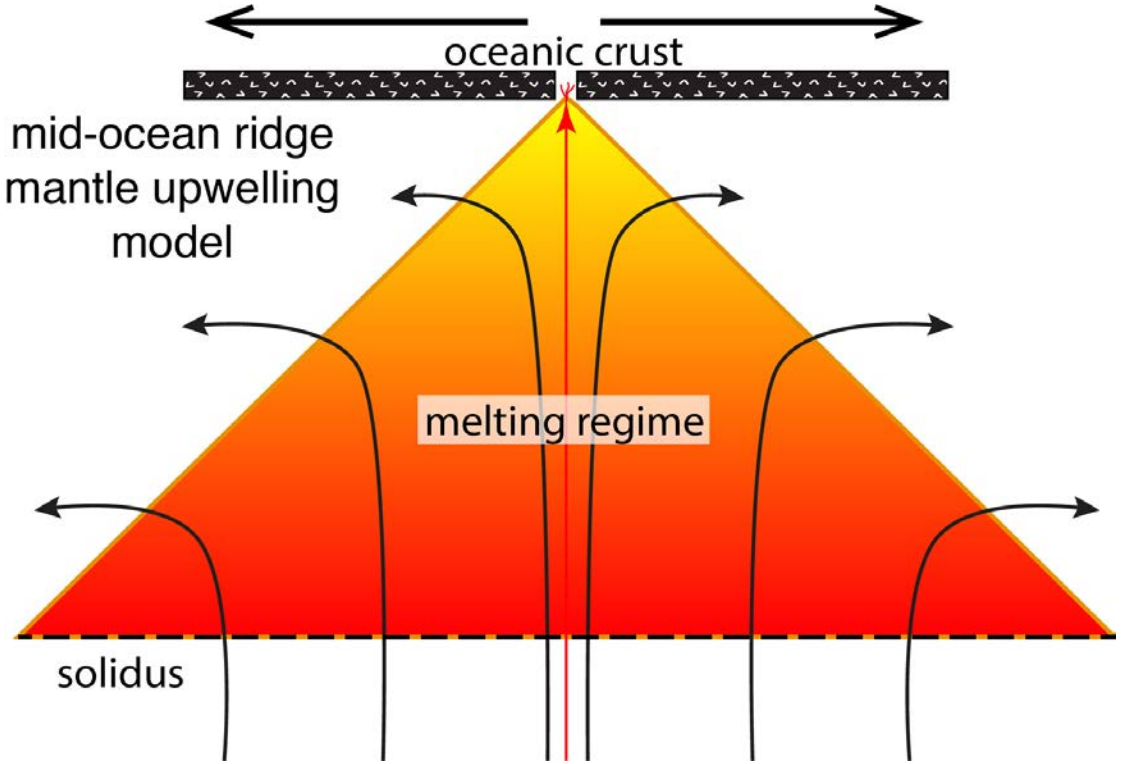


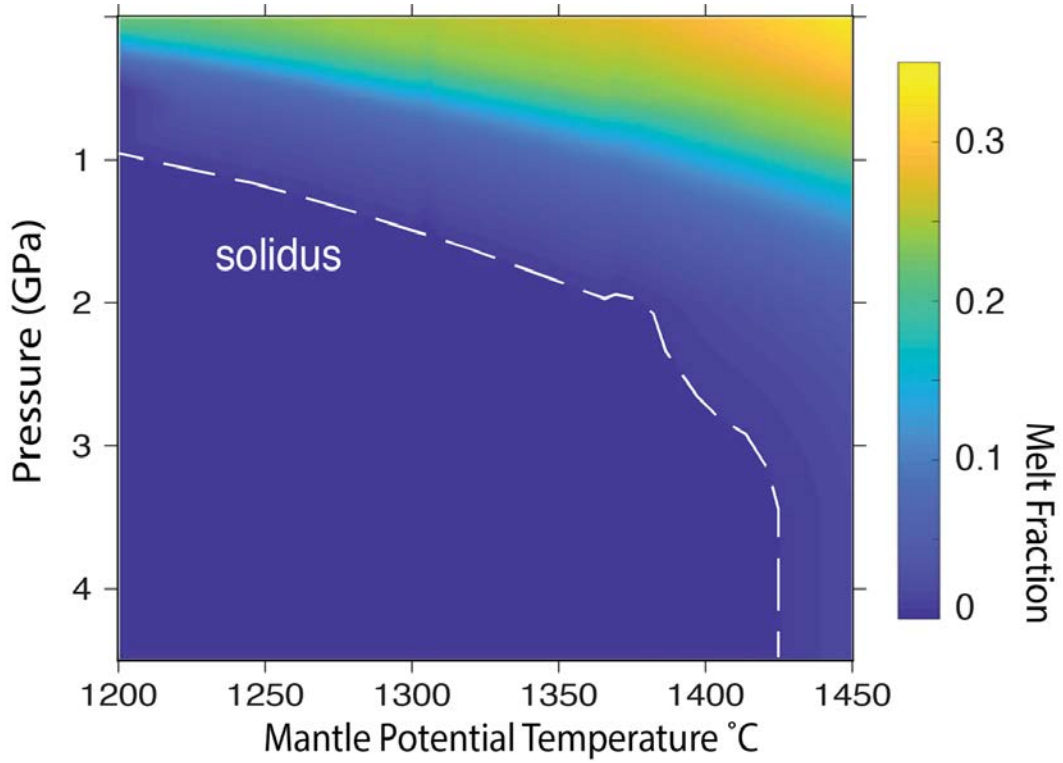
1) Between the ECMA and BSMA lies thinner (~6 km to the south and ~8 km to the north) crust with very high velocity lower crust (>7.5 km/s in some areas)

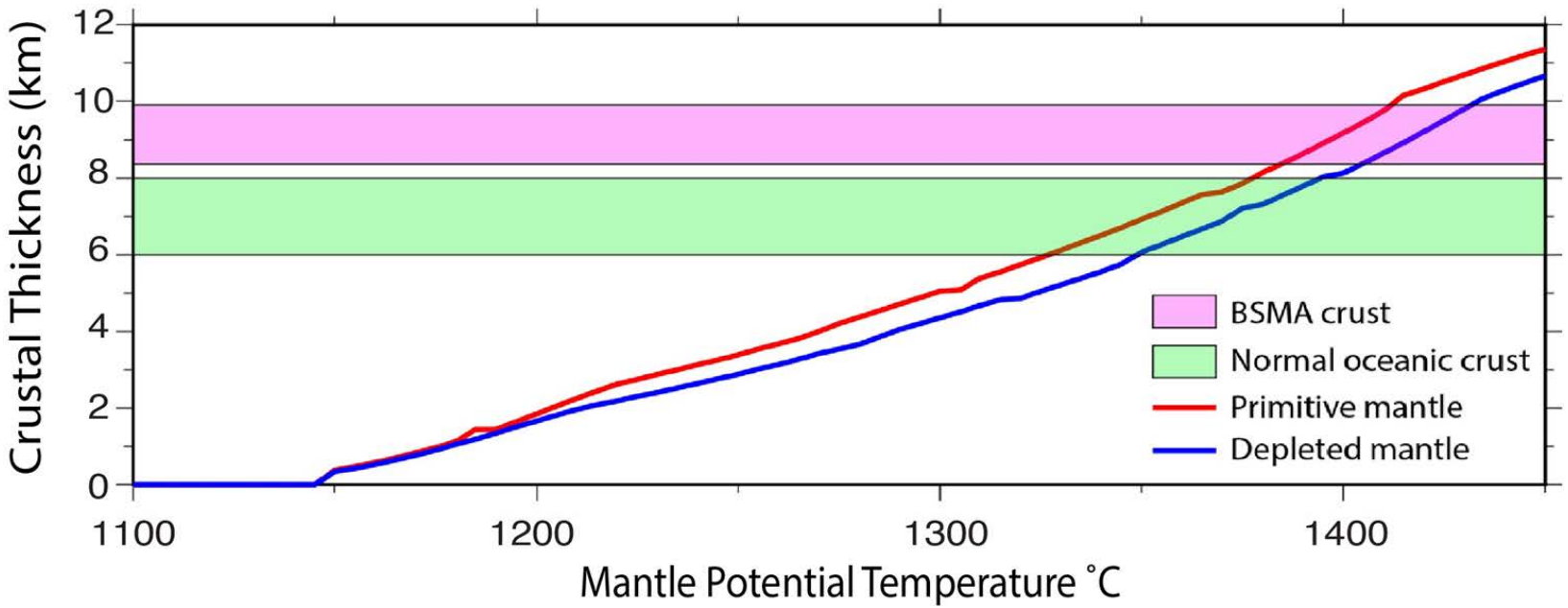
1) At the BSMA and outwards, we observe very thick crust, yet slightly high velocity lower crust

1) Along strike, the BSMA crustal thickness increases from 8.3 km in the south to 9.9 km in the north

1) Additionally, a slight increase in lower crustal Vp and Vs from 7.16 to 7.28 and 3.99 to 4.07 km/s



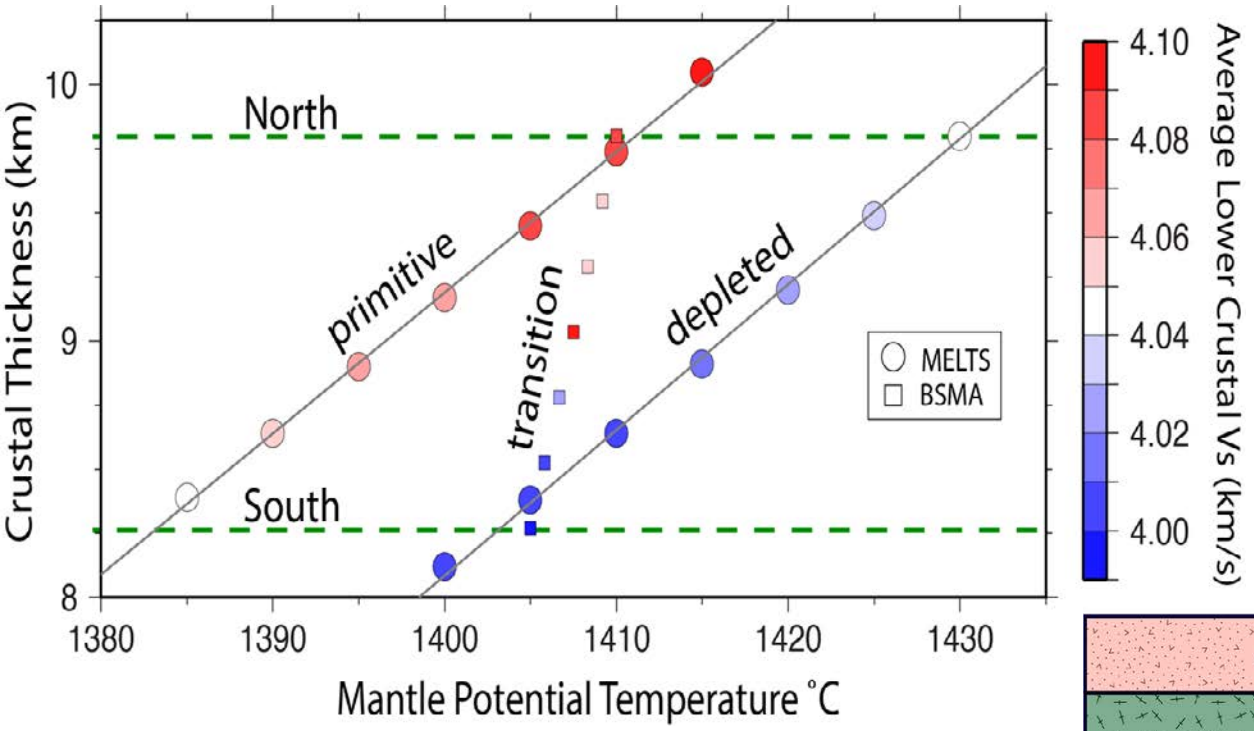


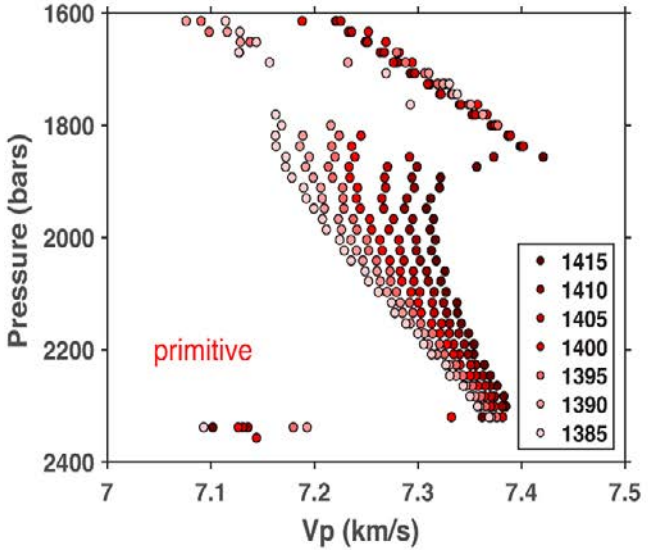


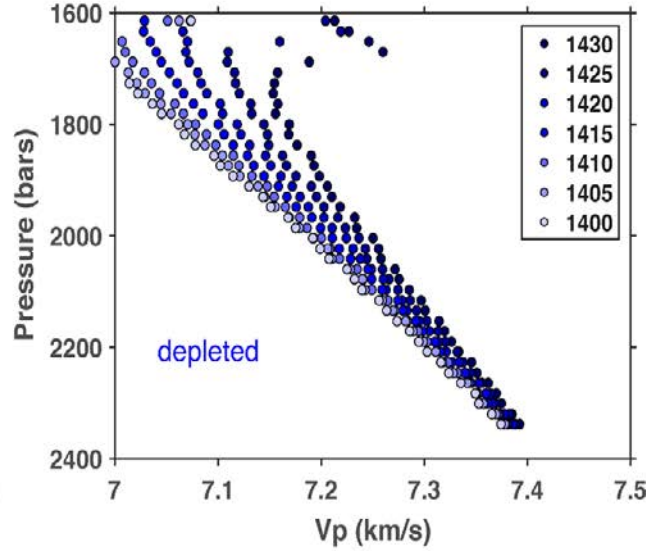
Higher mantle Tp means more melt and thicker crust

The mantle was hot, but not extremely hot

Fractional crystallization model where olivine, plagioclase, and clinopyroxene make up different fractions of the crust at different depths







Seismic velocity structure of BSMA requires higher mantle Tp, increasing slightly from south to north

Vs data suggests initial mantle composition may have been slightly depleted in the south

Thinner igneous crust between ECMA and BSMA can be explained by a lithospheric lid that was intact after the formation of the ECMA

Lithospheric breakup was prolonged and the margin is highly asymmetric