

## ***An Introduction to Intermediate Crust (IC): its Formation, Epeirogenic Character, and Plate Tectonics Significance***

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The plate tectonics paradigm currently posits that the Earth has only two kinds of crust - continental and oceanic - and the former may be stretched or the latter modified by arc/collision until it looks continental. But in seeking the 'continent-ocean boundary' (COB) along passive margins we need to think how the MOR process there would have been affected by heavy concurrent sedimentation. The evidence is that this, by blocking the hydrothermal cooling, inhibits magnetic anomaly formation and prolongs magmagenesis to give a much thicker mafic crust, here called IC, to distinguish it from Mature Continental Crust (MCC). I have shown (2008, *Int.Geol.Rev.* **50**, 685-754) that the hydrous content of deep MCC and of deeply subducted UHP slices gives them a big thermal epeirogenic sensitivity which IC lacks. My global analyses of block-and-basin (B&B) layouts within continents, begun in 1966, have shown, remarkably, that their MCC, identified by uplift and often by exposed geology, can be reconstructed by reversing a sequence of very precise (locally <5km) IC-generating separations, commonly in differing directions, such that the second was only made kinematically viable by the first. Clearly not a matter of chance!

The final step in this interpretation, and in justifying it here, is to explain the remarkable tightness dictated by the geometries, and the spreading of thermal rejuvenation to far from the present COBs. My analysis of global plate dynamical behaviour since ~150Ma (*Geophys. Res. Abstr.* **11**, EGU2009-6359; **12**, EGU2010-6101) shows that, for a petrological reason, LVZ material is actually very stiff and tectospheres reach >600km below cratons and even to >100km at MORs. To meet the latter requirement I offer my 25yr-old model for constructing thick plate at MORs. It has a deep, laterally-accreting, narrow (20cm?) mantle crack. So even a curved splitting line is precisely followed, as the B&B geometries require. I show 3 example analyses, each a record of relative plate motions:- (1) Shelf-forming 2-stage separation of Greenland-Svalbard from Norway after Scandian thrusting of the Greenland-built Western Gneiss onto Norway; (2) 5-stage Siluro-Devonian sequence in central Ireland; (3) Calabria, documenting 3-stage Permian(?) CCW rotation of Adria.

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Other information:

SESSION: CONTINENTAL MARGINS 2