Geophysical Research Abstracts, Vol. 6, 01309, 2004
SRef-ID: 1607-7962/gra/EGU04-A-01309

A PRELIMINARY INVESTIGATION OF THE CONTINUITY OF SUBDUCTION FOLLOWING TERRANE ACCRETION

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In a subduction process, the collision of two continents may result in one of two different modes: either the subducted slab breaks off and the plate boundary ceases to be active or the plate boundary reorganizes to continue plate convergence. In the latter case, after the collision of the continental fragment, the dense mantle of the fragment detaches from the buoyant crustal part and subducts with the oceanic slab. If such detachment does not take place the slab will break off. Our general aim is to identify the parameters that act as the switches between the two different modes of collision. We use a finite element model to solve mechanical equilibrium equation for a elastic-visco-plastic rheology and the heat equation since the viscosity is temperature dependent. We start with a 2D model in which a sliver of continental lithosphere is subducted along with a larger oceanic lithosphere,like in the Timor region, where continental collision is occurring following subduction of Tethyan oceanic lithosphere. The mantle wedge and the mantle below the slab are included in the model, in this way it is possible to take in account the lithosphere-astenosphere interaction. The system is driven by body force. Concentrating on where strain localizes, we predict under which conditions the two modes will occur.