Geophysical Research Abstracts, Vol. 8, 02914, 2006
SRef-ID: 1607-7962/gra/EGU06-A-02914

Plate acceleration: the obduction trigger?

P. Agard (1), L. Jolivet (1), B. Vrielynck (1), P. Monié (2), E. Burov (1)

(1) Laboratoire de Tectonique, UMR 7072, Université Paris 6, France, (2) Laboratoire Dynamique de la Lithosphère, UMR 5573, Université Montpellier 2, France (philippe.agard@lgs.jussieu.fr)

Obductions repeatedly emplace tracts of dense oceanic ophiolites on top of light, continental rocks, implying almost synchronous thrust movements along thousands of km. Obduction processes, however, are not well understood, partly due to later collisions that overprint the obduction record. Previous studies mostly focused on emplacement modes, and mechanisms triggering obduction were merely considered to result from a modification of the plate tectonic setting, either locally or in response to superplume events. Based on convergence velocities and blueschist formation, we show that the two recent large-scale, Upper Jurassic and Upper Cretaceous obductions coincided with periods during which velocities increased abruptly and more than doubled. We show that the latter obduction also modified the interplate coupling across the existing subduction zone. We finally propose a comprehensive model, in which large-scale obductions and the initiation of new subduction zones are triggered by intraplate instabilities resulting from plate accelerations. In a number of obduction cases, this sharp rise of velocities very likely resulted from the onset of superplume events.