

Interactive comment on “Up the down escalator: the exhumation of (ultra)-high pressure terranes during on-going subduction” by C. J. Warren

C. Warren

c.warren@open.ac.uk

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Many thanks to Reviewer 2 for highlighting some important missing and confusing aspects in the manuscript. Here I have attempted to respond to what I think are the main highlighted issues; the minor issues are more trivial to address in the revised version of the manuscript.

Geological data/context/background. Link metamorphic history to regional tectonic context:

I agree that it is critical that the geological data that provide evidence for the subduction and exhumation of continental crust are presented. I don't know why I didn't include this section, this was an oversight and it will be included up front in the revised version

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of the paper.

Treat different aspects in a more systematic manner to present available data and address future research:

My original aim was to try to discuss the factors that would allow continental crust to subduct to great depths (mainly the factors that contributed to its shear strength) and then discuss the factors that would allow it to exhume again (buoyancy, change in strength, changing tectonic forces). However this clearly came across as confusing and unsystematic so I will re-vamp the manuscript and try to come up with a clearer list of known/understood factors (or at least the ones we think we know/understand) and a list of unknown/not understood factors that may drive future research.

Vague introductory section – state aim more clearly. What is the message of this paper? Which aspect of the UHP issue does this paper address?

Ok – the point/message of the paper is obviously unclear, so in the re-write I will try to clarify the paper. I am going to concentrate purely on the subduction and exhumation of continental crust – I was trying to do this before but got distracted by other interesting UHP “stories”.

Improve discussion section; provide some clues to research directions in order to answer questions posed:

Agree – I think this will become much clearer once I tidy up the front end.

Figures – not all are essential:

Agree with regards to the cross-section of the Alps but disagree that I need “new” figures – this is supposed to be a review therefore using modifications of previously published figures is, I think, acceptable.

Discuss in more detail the factors/processes that control UHP environment, propose an original synoptic scheme:

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Agree, I think this will come out once I have tidied up the “take home message” as discussed above.

More updated view on exhumation literature, coherent vs incoherent tracts of UHP material and tectonic overpressure:

Thanks for pointing me in the direction of the Angiboust Monviso paper – I hadn't yet come across it. I am intrigued by the mention of tectonic overpressures by both reviewers – the models suggest that tectonic overpressures are possible, yet the amounts seem tiny compared to the uncertainty in the current pressure estimation methods. 10-20 MPa is within uncertainty and is really not going to change the burial depth estimates by enough to get excited about. Or am I missing something?

Title:

It's a pity that neither reviewer liked the title, I thought it was kind of catchy. But I agree that it probably doesn't fit the contents. I will have a think about the title once the revised paper takes on a bit of a clearer shape.

Minor comments :

All good points and will be taken into consideration during the revision.

CJW 17th September 2012

Interactive comment on Solid Earth Discuss., 4, 745, 2012.