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Solid Earth Discussions

Interactive comment on "Dynamics of interplate domain in subduction zones: influence of rheological parameters and subducting plate age" *by* D. Arcay

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I thank Referee 2 for her very constructive comments. I agree that results were initially badly illustrated by the choice of figures. I follow the clever suggestions made by Referee 2 and build a plot of the modelled z_{BDT} obtained as a function of z_{dec} in simulations of old subducting lithosphere subduction (new figure, with label 5). It is then much easier to illustrate the respective influence of each rheological parameters on z_{BDT} and z_{dec}. I recognise that former Figure 9 was awkward. I replace it by the same type of plot as mentioned just above, where z_{BDT} is presented versus z_{dec} for both young and old subducting plates. This highlights the influence of lithosphere

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ageing at trench. Initially, Figure 9 should have illustrated the range of modelled z_{BDT} and z_{dec} and the associated interval of interplate stresses. The latter, not depicted anymore, is now mentioned in the text. The final figure, asked by Referee 1, is a supplementary way to better communicate the paper results. As asked by Referee 2, I add the results in z_{BDT} and z_{dec} modelled 12 Myr after subduction initiation in Table 1.

Regarding minor comments, all the suggestions made by Referee 2 are taken into account in the revised manuscript: γ_c is replaced by γ when necessary; typos are corrected and I carefully re-read the text and made it more concise. I agree that the submitted manuscript was rich in mistakes in English writting... and apologise for it. I tried to correct the use of "besides" and "also".
Regarding the erroneous refence to Billen and Hirth, 2007, I confused in fact this paper with the work by Billen and Hirth, 2005 (GRL). I correct it on the revised manuscript.

Caption of Figure 1:
Brittle-ductile transition depth, z_{BDT}, versus interplate decoupling depth, z_{dec}, modelled after 12 Myr of convergence, for an old subducting lithosphere (simulations S6, S10, S10LG, S12, S13, S13HG, S13f14, and S14 in Table **??**). Both depths are equal along the thick black line.The influence of rheological parameters on z_{BDT} is highlighted in red, while the effect of rheological parameters on z_{dec} is displayed in green.

Caption of Figure 2:
BDT versus interplate decoupling modelled for young and old incoming lithospheres. The subducting lithosphere ageing at trench yields simultaneously a BDT deepening and a shallowing of z_{dec} (dashed arrows).

Interactive comment on Solid Earth Discuss., 4, 943, 2012.

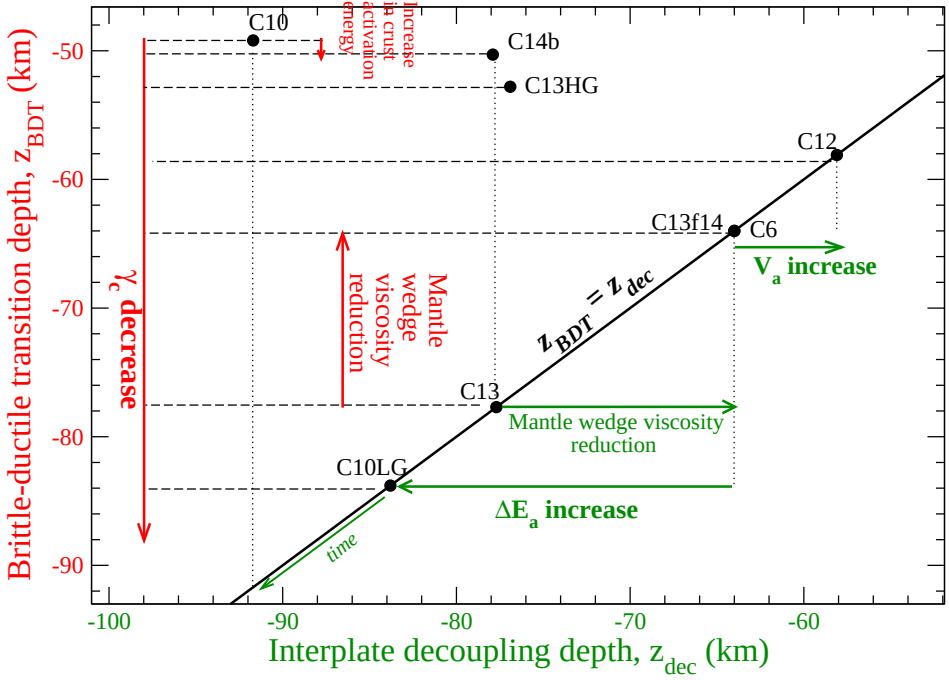

Fig. 1.

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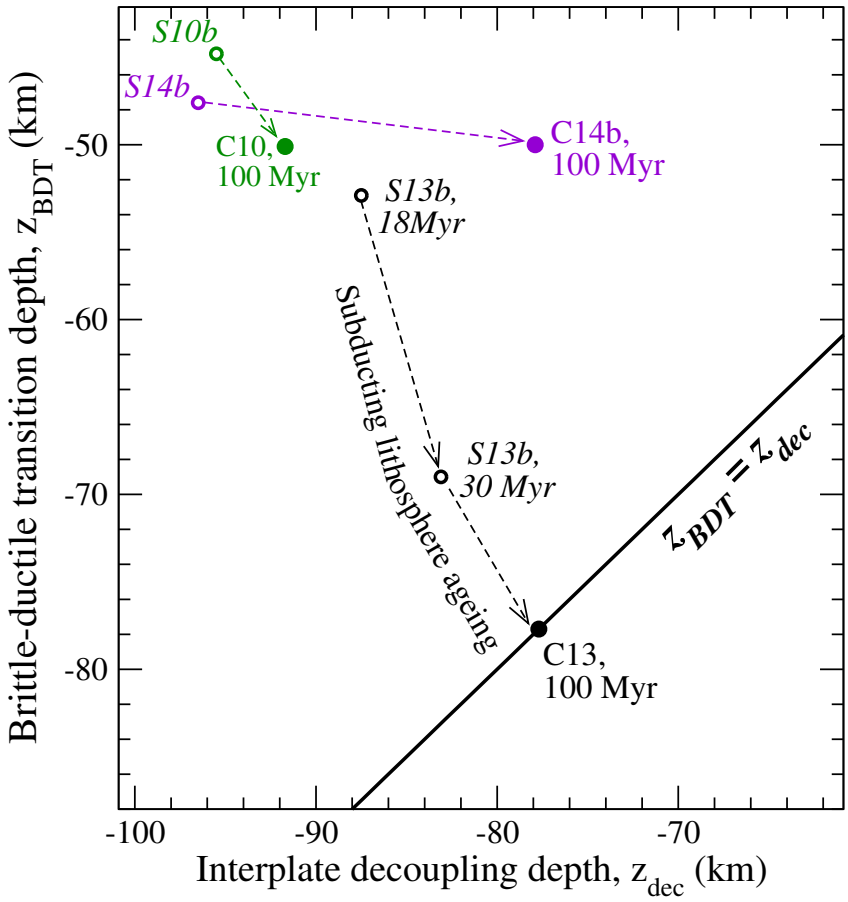

Fig. 2.

SED
4, C565–C568, 2012