

## ***Interactive comment on “Earth’s surface heat flux” by J. H. Davies and D. R. Davies***

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We very much welcome the constructive reviewer comments of C. Stein. A specific response to each point raised is included below

- 1) We have added the reference to Lee and Uyeda, (1965).
- 2) In response to the ‘puzzle’ concerning adding the 1TW to account for hot spots on young oceanic crust, we have added comments relating to the actual measurements at hot-spots, but retain this correction. So to repeat – this correction is required since the estimate of heat flux across young oceanic crust is based on models that were calibrated with data that intentionally avoided hot-spot regions. Following Jau-part, Labrosse and Mareschal, (2007) we have then added a conservative estimate of the additional heat flow.

3) Pollack et al., and Jaupart et al., unfortunately for this comparison, did not explicitly estimate a heat flux for glacial Antarctica.

4) Regarding the value of  $C$ , we find it interesting that the value is increased to  $473 \text{ mW m}^{-2} / \text{square root of age in million years}$  in Sclater et al (1980) compared to  $430 \text{ mW m}^{-2} / \text{square root of age in million years}$  Parsons and Sclater (1977). Since our objective was to illustrate the range in this correction we have not mentioned this explicitly in the text.

5) Regarding point 2 – since the discussion of the temperature of the base of the plate is not central to this paper – we have removed the sentences ‘One can argue that SS has too high a mantle (base of plate) temperature (1450 oC) and PS too low a mantle temperature (1350 0C). Consequently, an intermediate value is probably more reasonable.’ As the reviewer points out this, in it’s original form, was an incomplete description.

6) We will request that the final figures are increased in size.

7) Concerning Figure 1 – we have produced a new version of the figure, pointing out the data in Pollack et al (1993) and the data that is new in our data-set. This is Figure 2 in the revised manuscript.

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Interactive comment on Solid Earth Discuss., 1, 1, 2009.

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