# *Interactive comment on* "Martian atmospheric model with a high-fidelity subsurface thermal scheme" *by* M. D. Paton and A.-M. Harri

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Thank you for your comments. We have updated the (published) paper as follows. The numbers in brackets are the page and line numbers from the original submitted paper.

P738 line 16 (1/24)

Sentence rewritten:

The time of maximum surface temperature is significantly changed when the thickness of the material in the top layer is a moderate fraction of the skin depth of the same material without layering.

P739 line 27 (2/28)

Sentence rewritten:

It includes a long and short wave radiation scheme that models the absorption and emission of radiation by $CO_2$, water vapour and dust in the atmosphere. The scattering of light by dust is also modelled.

P740 line 13 (3/13)

Sentence rewritten:

Heat is exchanged with the environment, above the surface, that will include the Martian atmopshere, the sun during the daytime, and perhaps surrounding objects, such as rising terrain or, if in situ thermal measurements are being made, a spacecraft.

P746 line 6 (7/5)

Added the sentences at the beginning of the paragraph:

The depth of the lower boundary temperature, which is assumed to be constant, required for our thermal scheme was investigated by gradually increasing the depth of this boundary condition. It was found this boundary level could be fixed at the seasonal skin depth. The skin depth is . . . . . .

P749 line 7 (9/13)

Rewrote the sentence that starts on this line:

The magnitude of the temperature variation over diurnal and seasonal cycles will be smaller than for a thick dust layer. A larger amount of heat will be transferred between the dust layer and the rock underneath.

P741 line 8

Yes h is the heat transfer coefficient

P746 line 12

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Changed I to D

Interactive comment on Geosci. Instrum. Method. Data Syst. Discuss., 2, 737, 2012.

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