

Interactive comment on “Performance of thermal conductivity probes for planetary applications” by E. S. Hütter and N. I. Kömle

T.ÄäL. Hudson (Referee)

troy.l.hudson@jpl.nasa.gov

Received and published: 16 April 2012

The comprehensive review of line-source heat pulse methods in section 2 is very good.

Content Comments:

One big question about the context of this paper - or how it relates to other papers: The abstract mentions both “measurements and simulations”; and the conclusion’s second paragraph describes results of laboratory of the probes at ambient and vacuum conditions. Yet no experimental methods or data were given here. Two references are given (Hutter 2011 and Komle 2010), but the way the paragraph is written it seems to suggest that the tests were described in this paper. This paper should more explicitly call out where laboratory test data could be found, (i.e., that it was published in a

C31

separate paper) or confine itself to talking only about the modeling results as presented.

Figures 9,10,11,13,14,15,17,18,19: The authors note that the temperature curves tend to split up into groups, especially for very low and moderate thermal conductivity materials. Though a reader could decipher, either from reading the legends or the text, the essential difference between the groups, it is distracting to do so when looking at the figures. It would be helpful if annotations were put on the figures, perhaps to the right outside of the bounding box, indicating with braces {} what is special about each curve group. I.e., “With cable”, “No Cable”, etc. This annotations could be omitted for graphs where there are not distinct families of curves (e.g. Figure 10).

Typographical / stylistic comments:

Page 28 (and throughout): Can a different font be used for either k (conductivity) or K (diffusivity). These are too similar in appearance in the current font to be easily distinguished. Perhaps the often used lower-case α for diffusivity?

Page 35, line 7: “bended” -> “bent”

Section 3.3: This paragraph starts by talking about LNP02 first, then LNP03. The second sentence, though, describes LNP03 first, then LNP02. This makes the 4th sentence, which uses the terms ‘former’ and ‘latter’ a bit confusing. The figure referenced also mentions LNP02 first and LNP03 second. I recommend flipping the order of presentation in the second sentence.

Page 45, section 4.2: Sentence in line 13-15 “IN Fig. 8 the model of the TP02 is shown.” Is redundant with the first sentence of the section.

Page 50, section 4.3.1, line 22: “Except of the settings” -> “Except for settings” Page 51, section 4.3.2, line 16: “happening” -> “allowed” Line 17: “data was” -> “data were” Line 19: “considerable” -> “considerably” Page 52, section 4.3.3, line 9: “split up in” -> “split up into”; “First the temperature” -> “The temperature” Line 10: delete “which” Line 11: “secondly the curves with a lower...” -> “Curves with a moderate” Line 12:

C32

delete “that” Line 13: “poor contact and thirdly the curves” -> “poor contact. The curves that. . .”; “lowest temperature increase. These were. . .” -> “lowest temperature increase were. . .” End of section: There is no bulleted list here of observation summaries such as how calculated k compares with the true k, as for all of the other sections.

Page 57, section 5.4, line 8: “Thus the best evaluation. . .” -> “Thus the evaluation. . .”

Page 58, line 25: “were” → “where”

Page 62, Table 2: Last line, ‘contact’ column should say ‘poor’, not ‘no’. Page 67, Figure 1: Line styles for the independent integral terms should be different. If printed in black and white, these curves will be indistinguishable.

Figures 9,10,11,13,14,15,17,18,19,20: The drop-shadows on the circle, square, and triangle points are confusing. They make it hard to see the lines underneath when the lines are close to one another.

Interactive comment on Geosci. Instrum. Method. Data Syst. Discuss., 2, 23, 2012.