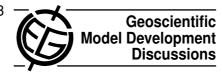
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### **GMDD**

5, C1196-C1197, 2013

Interactive Comment

# Interactive comment on "A new method to diagnose the contribution of anthropogenic activities to temperature: temperature tagging" by V. Grewe

# **Anonymous Referee #1**

Received and published: 11 January 2013

Review of "A new method to diagnose the contribution of anthropogenic activities to temperature: temperature tagging" by V. Grewe

The paper describes a methodology to tag specific contributions of a quantity to another used in atmospheric chemistry but applied to temperature. I find the idea quite interesting and at least for a simple box model easy to use. But as also pointed out by the author the implementation to a GCM might be more challenging. I find the paper interesting to read and understandable. I just have a few minor comments and three questions. I therefore recommend publication of the manuscript as soon as the corrections are made.

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Interactive Discussion

Discussion Paper



General comments (also out of personal interest):

- (i) You state that the quantities in Eq. 35 are split equally, i.e., 50% percent for each quantity. Is this really necessary or could you also use something different if you would use for example a different variable? And what about if you have three components influencing a variable? Would it be split in thirds?
- (ii) In the method section you write that for a doubling of CO2 you get a temperature change of 3.1K. In the section describing the doubling of CO2 experiment you have a much lower value. Did I misunderstand something? Shouldn't they be the same?
- (iii) This is a highly hypothetical question. If you would implement this tagging method in a GCM would it be worthwhile to derive the partial response as a function of height or is it better to use everywhere the same function and let it be zero? The only setting that I can think of that this would be the case is the influence of wind stress on temperature in the ocean.

# Specific comments:

- (i) pg 3196, first line: '... account. (...' should be '...account (...'
- (ii) pg 3203, line 22: '... causes toi temperature ...' should be '... causes to temperature ...'
- (iii) Fig. 3: Values on the right axis (Temp. change)?
- (iv) Fig. 9: Are the labels correct? If so, I have the impression that the values of Fig. 8 and Fig. 9 do not correspond.

Interactive comment on Geosci. Model Dev. Discuss., 5, 3183, 2012.

### **GMDD**

5, C1196-C1197, 2013

Interactive Comment

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