

## ***Interactive comment on* “Impact of an improved radiation scheme in the MAECHAM5 General Circulation Model” by C. Cagnazzo et al.**

**C. Cagnazzo et al.**

Received and published: 23 April 2007

### **Reply to Referee 2**

#### **Referee 2 asks:**

(from the Editor, quoting Referee 2): "unfortunately the authors again did not answer the question I raised the last times. I repeat what I wrote:

"Unfortunately, the authors still do not answer the obvious question whether 6 bands are sufficient or not to accurately model the warming rates in the atmosphere. They state that 6 bands result in a significant improvement, but is this enough or not in the judgement of the authors? To answer that question it is not necessary to perform new calculations with more than 6 bands, it is only a matter of an evaluation with the

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reference data."

### Our answer:

The *“obvious question whether 6 bands are sufficient or not to accurately model the warming rates in the atmosphere”* of Referee 2 is very vague, as stated. Thereafter, Referee 2 asks for our judgment.

The only way we can respond Referee 2 question is to reformulate the question in the context of our work, namely: *“Does the 6 band Fouquart and Bonnel scheme produce heating rate that we judge accurate enough for the simulation of the troposphere and stratosphere system in the MAECHAM5 model?”*

**Our judgement is that the 6 band Fouquart and Bonnel scheme produces heating rates that are accurate enough for the simulation of the troposphere and stratosphere system in the MAECHAM5 model.** This means that we judge that the Fouquart and Bonnel scheme does not need more than 6 bands for the computation of the heating rates in its current applications. See our comparison with the LBL (Figure 1 and 2, of the version submitted to ACP), and the performance of the scheme in the model (Figure 3 to Figure 8) for evidence.

Anything that goes beyond our reformulation of the Referee 2 question is beyond the scope of our work and therefore we do not think that we have to consider it.

We would like to remind Referee 2 that the number of bands in a radiation parameterization is only one aspect of the parameterization, as we have highlighted and detailed in our first response (AC S7002), and summarized in our second response (AC S7322)

to Referee 2.

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Interactive comment on Atmos. Chem. Phys. Discuss., 6, 11067, 2006.

ACPD

6, S7378–S7380, 2007

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