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Interactive comment on "Technical Note: The new comprehensive atmospheric chemistry module MECCA" *by* R. Sander et al.

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In this technical note the authors introduce their new chemistry module MECCA. The whole paper is very well structured, emphasising the author's main five points: chemical and numerical flexibility, modularity, portability and availability of their module. To my opinion, MECCA tends to be a great advantage for modellers working on atmospheric chemistry, and this technical note is a very good way to draw community's attention to MECCA.

The authors do well in introducing their concept. It becomes clear why the community really does benefit from this new chemistry module (though a multitude of powerful models has been developed over the years already). Each subsection of their model description is conclusive, introduced by a short motivation. This helps the reader to

even read through somewhat very specific (but short) parts like 'labeled reactions' in subsection 2.1.

I'm not a mathematician, and certainly most potential users of MECCA aren't. Thus it might be helpful to discuss the problem of the numerical solvers in one or two more sentences (a detailed description is beyond the scope of this paper, the reader should refer to the well written paper by Sandu et al. (1997)). To me, the important problem of solving 'stiff' equation systems remains somewhat unclear. The authors emphasise the need for solvers with automatic time step control, which I understood. When introducing the 'Rosenbrock' solver they mention schemes of second and third order. Are third order solvers needed for stiff equations? Or is it 'sufficient' to have the automatic time step control? Are Rosenbrock second order and automatic time step control exclusive? A short clarification would be fine.

The section 'results' gives a nice overview on the variety of MECCA applications. Results from box model runs to simulations with a global circulation model are presented. Each subsection is kept rather briefly and some papers 'in preparation' are cited. As MECCA is a new module and this paper is meant as a technical note, this seems acceptable to me.

I also downloaded the supplement and I encourage the reader to do so! It was possible to build the box model provided with the supplement on various systems which was a nice demonstration of 'portability'! The 'chemical and numerical flexibility' is indeed impressive. I made test runs starting from simplified tropospheric to complex stratospheric mechanisms. Switching between them only took a few seconds (the authors provide a shell script within the MECCA package to do so). No writing of a single line of code was necessary. On the other hand, experienced modellers gain the possibility to include further reactions by simply upgrading a text file provided with the MECCA package. The whole MECCA code itself is highly structured and very well documented.

All in all I highly appreciate the great work the authors present here!

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