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Interactive comment on “The generic MESSy submodel TENDENCY (v1.0) for process-based analyses in Earth System Models” by R. Eichinger and P. Jöckel

Anonymous Referee #2

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The paper "The generic MESSy submodel TENDENCY (v1.0) for process-based analyses in Earth System Models" introduces Fortran code as part of the Modular Earth Submodel System, that is used to determine model tendencies of prognostic variables broken down to the individual operators (the "submodels" in MESSy language). The provided example, an analysis of the lower stratosphere tape recorder, proofs the power of this tool. Application of TENDENCY will make complicated and very error-prone analysis of the final output products unnecessary, and will help to "proof" the conclusions of process studies.

The manuscript is well written and in my opinion will need only minor revisions before publication in GMD.

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1. Could the submodel be used e.g., for studies of the drivers of climate change, or the relevance of solar activity as a driver for atmospheric changes? I suggest that the authors provide further examples where TENDENCY will be useful for a detailed analysis, but also including limitations for such studies.
2. The manuscript appears repetitive in several paragraphs, for example the paragraph page 2221, line 19ff, is similar to the first paragraph on page 2220.
3. Please consider moving the namelist discussion on page 2228 to the supplement.
4. Introduction: How do other earth system (e.g., CESM1 from NCAR) or atmosphere-models handle tendency treatment? Are there comparable tools?
5. It should be pointed out that the code is written in Fortran programming language

Also, the other reviewer (C396) has already raised some important issues that should be clarified in a revised manuscript.

Interactive comment on Geosci. Model Dev. Discuss., 7, 2217, 2014.

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