

## ***Interactive comment on “Topology of sustainable management in dynamical Earth system models with desirable states” by J. Heitzig and T. Kittel***

### **Anonymous Referee #4**

Received and published: 17 September 2015

#### Review of manuscript

- 1) I find the paper plausible, including the propositions in the Appendix. I only partially followed the mathematical proofs. As I find the propositions already plausible, I think that the mathematical proofs are of less importance. Only proposition 4 I did not fully understand, because the terminology went into such a detail that I had difficulty to follow.
- 2) I cannot judge Section C in the Appendix, particularly the relationship to viability theory. I recommend asking J.-P. Aubin as a reviewer, especially because the authors refer to his theory throughout the manuscript.
- 3) Many of the figures I find only partly understandable. Particularly Fig. 1 I find too

C557

detailed and explained insufficiently, even though it is of great importance in guiding the reader through the manuscript.

- 4) Overall, I find the manuscript almost trivial, and I think there is too much emphasis on the math. A shorter paper with a focus on the basic idea with less, but more understandable examples would in my opinion be fully sufficient. Especially the repeated focus on open sets may be mathematically more precise, but it is unlikely to play a role in applications, so that the concepts could be described in a simpler way.
- 5) I found the distinction among the dilemmata the most interesting aspect of the paper, while the remaining parts did not provide me with insights. I could imagine that a focus on the dilemmata could strengthen the paper.
- 6) I found the reference to Earth system models in the title confusing.

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Interactive comment on Earth Syst. Dynam. Discuss., 6, 435, 2015.

C558