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Interactive comment on "Hilbert problems for the geosciences in the 21st century – 20 years later" *by* Michael Ghil

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A really good paper, very instructive and very readable. It is extremely useful to have a recap of scientific progress in some extremely important areas of long-term research in geosciences, and the author's personal perspective is very intriguing.

I have especially enjoyed Sects 4.2 and 5, as these are research areas I am way less familiar with. My clear impression is that they contain a lot of interesting and innovative ideas. I always had the vague intuition that delays in the response of the economic system to perturbations are associated with some form of irreversibility/nonequilibrium, and it was very satisfying to read the extremely insightful discussion and conjectures b the author.

Specifically, of great interest is the discussion of the FDT in the context of economics. I would recommend the author to add an explicit statement like the one at page 20 in the conclusions (".. To wit, internal endogenous fluctuations are likely to change in variance with the phase of the business cycle in the same way as the exogenously driven ones, i.e., larger "volatility" can be expected during expansions than during contractions of the economy."..) already at page 16, because the link between amplitude of the fluctuations and local sensitivity is not spelled out in a sufficiently explicit way, in my personal opinion. Maybe the author should expand a bit.

A small typo: Christian Huyghens -> Christiaan Huygens