

# Summary of the discussion

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Let us summarize our view of the discussion:

Someone (Lovejoy and Varotsos, 2016) proposes a scientific hypothesis and tests it against the data. They claim agreement between their hypothesis and the data with some level of *scientific* confidence, recognizing a) that *scientific confidence* is usually not quantifiable, b) that rigorous statistical hypothesis testing requires numerous additional hypotheses and assumptions, c) that such statistical testing can at best reject false hypotheses, never accept true ones.

Rypdal and Rypdal (2016) don't like L+V's scientific conclusions, so they concoct an alternative hypothesis (often pulled out of a hat without any attempted physical or scientific motivation, but no matter). They then perform a statistical test on their new hypothesis showing that it cannot be statistically rejected at some supposedly high level of statistical confidence. They then conclude that - since their alternative hypothesis cannot be rejected - that it must therefore be triumphantly accepted. Since the original L+V scientific hypothesis is logically incompatible with their new hypothesis, accepting the new one implies a rejection of the original one.

This is a complete abuse of both the scientific method, and also statistical hypothesis testing. With this approach- as we indicated in one of our previous responses - one can prove anything one wishes, including that the speed of light is infinite!

## References:

Lovejoy, S., and C. Varotsos (2016), Scaling regimes and linear/nonlinear responses of last millennium climate to volcanic and solar forcings, *Earth Syst. Dynam.*, 7, 1–18, doi:10.5194/esd-7-133-2016.

Rypdal, K., and M. Rypdal (2016), Comment on “Scaling regimes and linear/nonlinear responses of last millennium climate to volcanic and solar forcings” by S. Lovejoy and C. Varotsos, *Earth Syst. Dynam. Discuss.*, doi:10.5194/esd-2016-10, 2016.