

Summary of Lovejoy and Varotsos rebuttal (SC1, SC2, and SC3) to Rypdal and Rypdal comment and replies (AC1, AC2, AC3, and AC4)

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Any readers who have followed the exchange of our opinion (<http://www.earth-syst-dynam-discuss.net/esd-2016-10/esd-2016-10-SC1-supplement.pdf> , <http://www.earth-syst-dynam-discuss.net/esd-2016-10/esd-2016-10-SC2-supplement.pdf>, <http://www.earth-syst-dynam-discuss.net/esd-2016-10/esd-2016-10-SC3-supplement.pdf>) with those of Rypdal and Rypdal (2016a-e) (R+R, below) up to this point will have noticed that the discussion is now far from our original paper (Lovejoy and Varotsos, 2016) and that Rypdal and Rypdal (2016a-e) are unable to discuss the issues in simple and widely accessible terms. They constantly impute to us either irrelevant or unnecessarily - and inappropriately - precise mathematical assumptions and then try to demonstrate that these assumptions - that we do not make - are problematic. One gets the impression that they have difficulty distinguishing mathematics from geophysics.

The debate about linear versus nonlinear behavior clearly illustrates the difference between our two approaches. Our physically based approach asks under what conditions - over what range of fluctuation time scales and amplitudes - is a linear model *a useful, reasonable* approximation to the real world system. In comparison, R+R's attempt to solve the problem mathematically is futile if only because linearity is a special case of nonlinearity: it is therefore *in principle* impossible to numerically or empirically prove that a given system is linear. At most one can place upper bounds on the *degree* of nonlinearity, and even this requires further assumptions in order to restrict the possible types of nonlinearity to a manageable framework. In essence, R+R's approach represents a Platonic attempt to settle scientific questions by mathematics. In their latest response, their obsession with mathematics leads largely to a war of words with R+R constantly using needlessly restrictive definitions - notably of Levy processes and multifractals - and then accusing us of not using their definitions!

Up until now, we have endeavored to maintain the discussion at a level that will be of interest to the general ESD reader, but now we have reached the limits of what is possible in the confines of ESDD discussions: the exchange has become unproductive and it serves no purpose to continue.

References:

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