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Climate of the Past Discussions

Interactive comment on "Astronomical forcing and mathematical theory of glacial-interglacial cycles" *by* A. V. Kislov

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The final author comments on “Astronomical forcing and mathematical theory of glacial-interglacial cycles” by Alexander Kislov

There were three anonymous Referees. Critic’s remarks can be grouped as follow:

1) It is not clear what’s new here, … such equations … were in fact very useful, about 20 years ago. (#2) All these cases, … have been discussed extensively in the literature more than two decades ago. Unfortunately, the author adds no new physical insights or comments on the connections between the models and physical processes as described (#3) The author does not present any new ideas on the relationship between parameters in these models and physical processes related

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to glacial cycles (#2)

2) The model (10) can also represent the ENSO cycle …(#1)

3) The paper also ignores much of the recent related literature on Milankovitch forcing and glacial cycles (#2).

4) As a technical comment I was surprised by the statement following eqs. (4)-(5) that the process described by eq. (4) - the Wiener process - represents a system with infinite memory. As well known from any Introductory book on stochastic processes, the Wiener process is in fact a typical example of a continuous Markov process! (#3)

Below I give my comments.

1) These remarks are too sharp and not completely fair. On the one hand, indeed, many effects were discussed earlier. However it is not the basis for refusal of their use. On the other hand, in the article all effects are particular solutions of the equation (2) and such approach is realized for the first time. Further, the statement, that “such equations … were discussed at 20 years ago” is incorrectly, because the stochastic equation of spontaneous transitions (the equation (7)) was not applied earlier. And, at last, not all effects can be filled with the physical contents at the first statement of the theory. It is a subject of the following researches.

2) Indeed the delayed oscillator model was used earlier as a model of El Nino-La Nina cycle. Besides this model was frequently used in various areas of theoretical physics. Not clear, why application of this model for modeling of the climate fluctuations is not pleasant to the reviewer.

3) I could write on this theme much, because I am participant of the Paleoclimate Mjdeling Intercomparison Project. But I was not going to discuss the Milankovitch effect in detail. It is examined alongside with other effects.

4) I am very glad that the Anonymous Referee #3 so carefully investigated the introductory books on stochastic processes. Indeed, I agree that the Wiener process is an

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example of a Markov process. It is clear. It is not clear why this fact was so stressed by the Referee #3?

Interactive comment on Clim. Past Discuss., 5, 327, 2009.