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Comment

## ***Interactive comment on “Past and future ice age initiation: the role of an intrinsic deep-ocean millennial oscillation” by R. G. Johnson***

**Anonymous Referee #2**

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The manuscript by Johnson presents an alternative hypothesis on the mechanism of glacial inception and prediction for the future one. Although Milankovitch theory of the glacial cycles is now generally accepted, exploring of the other (not necessarily alternative) mechanisms can be still useful and could potentially contribute to a better understanding of climate system dynamics. Still it is vital to put the new hypothesis in the context of the current knowledge. Unfortunately, all but one paper cited in the manuscript are older than 10 years which is a very unfortunate because significant progress in understanding of glacial cycles was achieved during the past decade. This is one of the aspect where the manuscript can be significantly improved. However, I am much more concerned about predictions of the new ice age in the coming decades. There are already no shortage of catastrophic scenarios and I see no need to multiply them without serious justification. The mechanisms of the “immanent” glacial inception

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proposed by the author can be easily tested with the modern climate models and I am not aware about any indication that the possibility of triggering of new ice age by reduced river discharge into the Mediterranean Sea is real.

### General comments

1. The abstract of the paper is unusually and unnecessarily long which makes also impossible to read and appreciate it. It would be very helpful to shorten it to a normal size.

2. The motivation for the development of the new mechanism of glacial inception is the failure of Rind et al. (1989) to simulate glacial inception with a coarse resolution atmospheric GCM under the cold (115 ka BP) orbital configuration. However, in recent decades a number of similar studies with substantially improving climate models have been performed and they provide rather different conclusion: Milankovitch theory does work. This, of course, does not automatically imply that other mechanisms apart from changes in summer insolation do not play any role in shaping glacial cycles. Still, the success of the Milankovitch theory should be acknowledged.

3. One of the premises of the hypothesis proposed by the author is the existence of mysterious 1500-yr cycle. The situation with this cycle is rather ambiguous. Very few studies really support existence of the cycles found by Bond et al. In any case, even if such weak cycle does exist in the climate system, its importance for glacial cycles is questionable at best.

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Interactive comment on Earth Syst. Dynam. Discuss., 5, 545, 2014.

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