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

Anonymous Referee #1

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Based on an ad-hoc hypothesis centered on an intrinsic oscillation of deep-water formation the author attempts to explain a range of climate-variability features, which occur on millennial timescales. Unfortunately, no new data or analyses of existing data are presented to convincingly support the proposed mechanisms. The author’s ad-hoc combination of reconstructed and observed climate variability pattern seems to ignore any difference between local/regional climate changes from those taking place at a hemispheric or global scale (e.g. some of the “fix points” used for tuning the phase in Fig. 6 are certainly not “global” events; cf. Wanner et al. 2008, QSR).

While the jury is still open on the amplitude of interglacial fluctuations in NADW strength, it seems unlikely that these changes were strong enough (compared to the glacial variations) to account for the reconstructed global changes. Furthermore, the

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idea that the MCA-LIA transition is part of a "natural" climate cycle is not new and was already suggested by Bond et al. (2001).

I am also concerned that the selection of literature leaves out a large number of publications, which have dealt with the possibilities for internal ocean oscillations and, more importantly, the underlying physical mechanisms (see textbook by Dijkstra (2013) for an overview). The same holds true for spatial patterns of climate variations during the Holocene (e.g. Wanner et al., 2008; PAGES-2k, 2013). Overall, I have the impression that the contribution does not reflect the rich body of literature of the past decade on physical mechanisms underlying climate variations during interglacials or during glacial inceptions.

As it stands, the absence of new information/data, lack of testable hypotheses, or thorough review of the existing literature does not leave enough substance to envision this essay as part of the scientific literature.

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

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