

## ***Interactive comment on “Long-range memory in millennium-long ESM and AOGCM experiments” by L: Østvand et al.***

**Anonymous Referee #1**

Received and published: 22 April 2014

The authors quantify long range memory (LRM) in millennium long records from various models. They wish to tackle the following issue : Does the long term memory come from memory in sun activity or volcanic activity? (This was earlier suggested by Rybski et. al. 2008). To answer this question the authors suggest a two-fold approach : 1. to remove from the data a fitted linear response model output based solely on proxies of the forcing. 2. usage of control runs. Their general conclusion is that long range memory exists regardless of external forcing. They explain a discrepancy with smaller long range memory values in reconstructions due to Moberg et. al. 2005, and discrepancies with Rybski et. al. 2008 mainly by pointing out that in both cases maritime zones had less weight and continental zones had more weight in the averaged behavior captured by the records.

C100

I find the evidence presented to be convincing and thorough and the presentation full and fair. I therefore recommend on acceptance.

A minor point which I do not consider crucial for acceptance is the title, which does not mention the main research question (LRM due to forcing vs. LRM due to internal variability).

---

Interactive comment on Earth Syst. Dynam. Discuss., 5, 363, 2014.