

## ***Interactive comment on “ $\delta^{18}\text{O}$ water isotope in the iLOVECLIM model (version 1.0) – Part 2: Evaluation of model results against observed $\delta^{18}\text{O}$ in water samples” by D. M. Roche and T. Caley***

**Anonymous Referee #2**

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### General Comments

The authors present an evaluation of a pre-industrial simulation of delta O-18 in iLOVECLIM, a new version of the LOVECLIM Earth system Model of Intermediate Complexity (EMIC), described in a companion manuscript. The evaluation demonstrates the overall realism of the simulation, while highlighting some important caveats (over Antarctica, the Mediterranean) that should be kept in mind if the model, or output, are adopted by others. Given the broad realism, iLOVECLIM should prove useful as an efficient EMIC for investigating delta O-18 distributions, in the oceans and over continents/ice sheets, for a range of past climates. As a model evaluation, the manuscript should be suit-

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able for publication in GMD, subject to minor and technical revisions in response to the comments below.

### Specific Comments

1. p.9, l.7-9: I am confused by the sentence starting “Overall, an inverse relationship ...” – broadly the same correlation patterns appear in both Fig. 6 and Fig. 7, so how is the relationship “inverse ... between delta O-18 in precipitation and temperature, compared to precipitation rate”?
2. Figs. 6 and 7: Please use stippling, or masking, to indicate where the correlations are significant, and explain any significance test in the caption. Ideally, also use the same min/max limits in the colour scales of both figures, for straight comparison of the strength of delta O-18 correlation with precipitation rate and temperature.

### Technical Corrections

1. p.2, l.20: H<sub>2</sub>O<sub>18</sub> is named twice in the bracket – do the authors mean HD O<sub>18</sub>?
2. p.3, l.20: “. . . of water isotopes on millennial timescales”
3. p.3, l.24: “. . . of water isotopes for our current climate in the first instance”
4. p.8, l.17: “two latter regions”
5. p.10, l.2: “leading to much less saline waters (and unrealistically depleted delta O-18)”
6. p.10, l.8: “different”
7. p.10, l.14: “too little”
8. p.11, l.27: “The latter water mass . . .”
9. p.12, l.3: “Very low observed surface values . . .”
10. p.12, l.14: “even when taking this aspect into account”

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11. p.12, l.29: “reproduces faithfully”

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