## REFEREE REPORT FOR THE PAPER "INFERRING PALEO-ACCUMULATION RECORDS FROM ICE-CORE DATA BY AN ADJOINT-BASED METHOD: APPLICATION TO JAMES ROSS ISLAND'S ICE CORE" BY CARLOS MARTIN, ROBERT MULVANEY, G. HILMAR GUDMUNDSSON, AND HUGH CORR

NOEMI PETRA

I am pleased to see that the updated manuscript is much improved over the original submission. Here are my (minor) comments for the second revision:

- 1. In reply to my previous comment (Section 2., n) on "Typical value for c in the context of the Armijo condition is  $10^{-4}$ ", indeed the authors are right that  $c \in (0, 1)$ . In practice (and in my experience) c is chosen to be quite small (see for instance Section 3.1 in the "Numerical Optimization" book by Nocedal & Wright).
- 2. This is not major, but I find it a bit hard to follow when certain functions are not consistenly defined (for instance sometimes the authors show the dependence on the spatial and/or temporal variables and other times they don't, see  $\lambda$ ).
- 3. I assume there is no connection between n on pag. 9 and the ice-flow parameter n. Please correct this variable overlload.
- 4. In the Appendix (pag. 18), I believe the sign in front of the second term of the gradient expression should be negative (this follows from the definition of w(z,t) given by Equation (2)). Also, the sign of the same term in the second equation is missing.