

Having read through the responses to reviewers and the new manuscript I am very pleased to see the effort the authors have put into improving the manuscript. I should say I am not an expert on ice core dating and i do hope that reviewers 1 and 2 will have read over your response and do not have any issues with the new material regarding experiments. But as far as I am concerned this is a marked improvement and gets across the ideas far more clearly.

I am happy to accept almost as-is, however i spotted a few typos that should be fixed as well as language issues, see attached marked-up PDF.

The language issues have been fixed, thanks.

In addition, given the confusion surrounding 2.2 (now 2.3), which i now understand better, it is still somewhat confusing, as (a) you treat the firn thinning function as depth-dependent though it is close to 1, and (b) i would think it is also an approximation to treat firn density as constant across the firn layer and in time. Hopefully in the final version you can add a few brief words to clear this up -- but my decision is still to accept subject to technical corrections.

We now write:

“The right-hand side of the third equation is an approximation, since we assume 1) that the incompressible thinning function in the firn is constant through time, which is almost verified since strain variations are very small in the top layer of the ice sheet and 2) that the firn density is constant through time, as suggested by firn densification models (Parrenin et al., 2012a).”

i am just curious -- this is the inverse of a tridiagonal $\begin{bmatrix} 1 & -2 & 1 \end{bmatrix}$ matrix? this is interesting as it is an inverse correlation matrix often used as a prior in glaciological stress balance inversions..

Could you point us toward a reference? We will study in more details if a parallel can be drawn with the inversion of stress balance.