Response to Anonymous Referee #1

Specific comments

L339ff: The influence of the Ekman component on the subtropical AMOC is much stronger in the GC2 model compared to all other models (green lines in Fig. S2c and d). Can you speculate about the reasons?

Response: We believe that it is related to the same problem discussed later on in the paragraph, that is, that NAO associated winds induce an instantaneous increase of the subtropical AMOC and at the same time exert a delayed influence on the PC1-LSD, which also affects the subtropical AMOC with a delay. The final correlations between PC1-LSD and the full AMOC (i.e. with Ekman) depend on how quickly the PC1-LSD propagates to the subtropics and impacts the AMOC, and how this interferes with the Ekman driven signal. We can see in Figure S2c that the delay of the maximum correlation between PC1-LSD and AMOC26 is particularly long in GC2 and rather weak when compared with the other models with a similarly long lag. These two factors might determine why the interference between the two signals has such a strong impact in GC2. The specific case of GC2 is now discussed in the paragraph.

Technical corrections

Please check all σ2 and correct them to σ_2.

Response: Done

L256: Figure 1d, not 1c. In general, the signs of the result of an EOF analysis are arbitrary. How do you know that PC > 0 corresponds to a decreased density stratification and not the other way around? If you infer that from the positive relationship between PC1-LSD and deep LSD from Fig. 2d, then please mention it in the text.

Response: The reference to Figure 1d has been corrected. Regarding the sign of the EOFs, we have taken advantage of the fact that it is arbitrary (as well pointed out by the reviewer) to describe all EOFs as an intensification of the density stratification. This implied changing their sign (together with the sign of their associated PC) in the individual cases in which the EOF originally computed represented a decrease in stratification. This is now specified in the caption to Figure 2.