In your discussion of the solubility effect I suggest to consider new results from Khatiwala et al. (2019, doi: 10.1126/sciadv.aaw4981) that show disequilibrium effects lead to a much larger temperature effect on atmospheric CO2 that previously thought.

Thanks for the suggestion. We have included discussion of the results of Khatiwala et al 2019 and their significance for our study in the updated manuscript:

Lines 224-234: Our data allow us to put new constraints on the role of the solubility pump in atmospheric CO_2 variations across the studied intervals. Out of the full ~80 ppm CO_2 from MIS 5e to MIS 4, our modelling suggests that MOT changes can explain 41±4 ppm. These estimates of the solubility pump agree well with the canonical 10 ppm/°C (Williams and Follows, 2011). However, our MOT data provide no information on the spatial distribution of ocean temperature change, which a recent study suggests plays an important role in modulating the strength of the solubility pump via changes in ocean saturation state (Khatiwala et al., 2019). The referenced study found that changes in air-sea disequilibrium between interglacial and glacial ocean conditions enhanced the solubility pump by ~60% during the last glacial maximum. If such disequilibrium effects are also relevant for the timescales and periods considered here, our solubility-driven estimates from the carbon cycle model simulations may be considered a lower bound. In particular, if the enhanced disequilibrium effect is linked to the onset of the glacial mode of ocean circulation at the MIS 5a-4 transition, then the solubility pump may play a larger role there than suggested from our simplified carbon cycle modeling.