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Modelling the Isotopic Response to Antarctic Ice Sheet Change During the Last Interglacial

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Ice sheet changes can exert major control over spatial water isotope variations in Antarctic surface snow. Consequently a significant mass loss or gain of the West Antarctic Ice Sheet (WAIS) would be expected to cause changes in the water isotope record across Antarctic ice core sites. Analysis of sea level indicators for the last interglacial (LIG), around 125 to 128 ka, suggest a global sea level peak 6 to 9 m higher than present. Recent NEEM Greenland ice core results imply that Greenland likely provided a modest $\sim$2m contribution towards this global sea level rise. This implies that a WAIS contribution is necessary to explain the LIG sea level maxima. In addition, Antarctic ice core records suggest that Antarctic air temperatures during the LIG were up to 6°C warmer than present. Climate models have been unable to recreate such warmth when only orbital and greenhouse gas forcing are considered. Thus changes to the Antarctic ice sheet and ocean circulation may be required to reconcile model simulations with ice core data. Here we model the isotopic response to differing WAIS deglaciation scenarios, freshwater hosing, and sea ice configurations using a fully coupled General Circulation Model (GCM) to help interpret Antarctic ice core records over the LIG. This approach can help isolate the contribution of individual processes and feedbacks to final isotopic signals recorded in Antarctic ice cores.