



Antarctic Last Interglacial Isotope Peak in Response to Sea Ice Retreat not Ice Sheet Collapse

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Several studies have suggested that the Antarctic Ice Sheet was the primary contributor to sea level rise during the last interglacial (LIG; 130,000 to 115,000 years ago), most of which is hypothesized to have come from the unstable West Antarctic Ice Sheet (WAIS). Collapse of the WAIS would contribute ~ 3.5 m to the 5-9 m sea level rise reconstructed for the LIG. The prevalent hypothesis is that WAIS loss coincided with the peak Antarctic temperature and stable water isotope values from 128,000 years ago (128 ka); very early in the last interglacial. Using Bayesian multivariate linear regression and a statistical model comparison to combine isotope-enabled climate model simulations with Antarctic ice core data, we show that WAIS loss is not consistent with the isotopic evidence at 128 ka. Instead, a 65 ± 7 % retreat of Antarctic winter sea ice area best explains the 128 ka ice core evidence. This finding of a dramatic retreat of the sea ice at 128 ka demonstrates the sensitivity of Antarctic sea ice extent to climate warming. These results may also provide supporting evidence for WAIS loss and sea ice build up later during the LIG.