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## Inferring the Last Interglacial West Antarctic Ice Sheet from the coupling of an ice core water stable isotope record and an atmospheric general circulation model

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The Last Interglacial period (130-115 ka BP, hereafter LIG) is often considered as a prime example to study the effect of warmer-than-present temperatures on polar ice sheets evolution. As the debate mainly focuses on the causes and tipping point of a potential collapse of the West Antarctic Ice Sheet (hereafter WAIS), few investigations examine the consequences of a wais collapse in terms of atmospheric circulation. However, a knowledge of the state of the atmosphere is necessary to use proxy data recorded in ice cores. By analysing a new ice core drilled in Skytrain ice rise and using climate modeling, the WACSWAIN (WArm Climate Stability of West Antarctic ice sheet in the last Interglacial) aims to reconstruct WAIS extent during the LIG. Here, we use simulations from the atmospheric general circulation model HadCM3 with different WAIS configurations. We show that changes in temperature are directly linked to changes in orography through thermodynamic effects, as well as a linear sea ice extent rise over the Pacific Ocean with the WAIS reduction explained by a reversal of meridional winds turning southwards as the WAIS disappears. At the Skytrain ice rise, we show that not only the isotopic thermometer can be applied, but we also suggest that the water stable isotope record imprinted in the ice core will allow us to quantify the wais reduction.

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