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New insights in the onset of Antarctic glaciation

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The Eocene-Oligocene Transition (EOT, $\sim$34 Ma) marks the onset of major Cenozoic glaciation through the relatively rapid establishment of Antarctic ice-sheets. Deep-sea oxygen isotope records across the EOT are characterized by a $\sim$400 kyr spaced two-step increase in values, reflecting both cooling and cryosphere expansion. In order to disentangle these, we have reconstructed sea surface temperatures (SSTs) using $TEX_{86}$and $U^{K'}_{37}$ paleothermometry on the relatively complete sequence of Deep Sea Drilling Project (DSDP) Site 511 in the southwest Atlantic Ocean. The results illustrate that cooling is largely confined to the first (EOT-1 or precursor) shift, whereas only minor cooling is apparent in conjunction with the second, most prominent shift, the 'Oligocene isotope event -1' (Oi-1). Regarding continental ice formation, this implies that mainly the Oi-1 proper reflects the principal time of accumulation.