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Response of the tropical ocean-atmosphere system to high-latitude forcing during Dansgaard-Oeschger events

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During the last glacial period, Greenland and subpolar North Atlantic experienced abrupt temperature shifts, so-called Dansgaard-Oeschger (D-O) cycles, suggesting tight regional climate connectivity in the high northern latitudes. By contrast, the response of the tropical ocean-atmosphere system to abrupt climate change in the north is less well understood, due to difficulties in cross-dating marine and ice cores and a general lack of solid multi-proxy records from the tropical region. Here we aim to close this gap by using a sediment core from the SE Caribbean Sea, located under the direct influence of the Intertropical Convergence Zone (ITCZ) and the Atlantic meridional overturning circulation (AMOC). Our high-resolution Ti/Ca record reveals abrupt shifts in terrigenous inputs and hence precipitation in the northern South America that presumably phased D-O cycles in Greenland due to rapid high-to-low-latitudes atmospheric reorganizations involving shifts in the ITCZ. Furthermore, based on $\delta^{18}O$ values, we imply that sea surface in the SE Caribbean Sea warmed during (cold) Greenland stadial events of MIS 3-5. We suggest that, because these inferred warming trends correlate with temperature development in Antarctica, they contain imprints of oceanic teleconnection associated with the AMOC variability.