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Variability in the position of the ITCZ and the East Asian monsoon intensity during the last glacial-interglacial cycle

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We use marine sediments from the Mentawai Basin west of Sumatra to asses the regional paleoceanography, sedimentation patterns and past variation of the East Asian winter Monsoon (EAWM) and the Inter Tropical Convergence Zone (ITCZ) on glacial-interglacial time-scales. Mg/Ca measurements on planktonic foraminifera yield average Holocene sea-surface temperatures (SST) of $\sim$28.5˚C and glacial SST of $\sim$26˚C, resulting in a glacial-interglacial SST difference of $\sim$2.5˚C off W Sumatra. Shell δ^{18}O of the same species decreased about 1.7 permil within the last two glacial terminations and lagged the SST by $\sim$1500 years. The combined Mg/Ca and δ^{18}O data implicate negligible regional salinity changes on glacial-interglacial time-scales.

A narrow, far-off shelf and a relatively open basin in addition to excellent carbonate preservation favor the terrigenous fraction of marine sediments in the study area to reflect onshore precipitation rather than changing sea-level or dilution/dissolution biases on glacial-interglacial time-scales. Today, the EAWM, or the NW monsoon, provides most of the rainfall over Sumatra when it merges with the ITCZ rainfall from November through April. In the northern part of the Mentawai Basin off central Sumatra and north of the present-day mean position of the ITCZ in winter, maximum terrigenous fraction in marine sediments occurred during the last glacial corresponding to the northern hemisphere insolation minima, and minimum values during the interglacials and insolation maxima. Conversely, maximum terrigenous fraction in marine sediments from the southern part of the Mentawai Basin off SW Sumatra and south of the present-day mean position of the ITCZ in winter corresponds to the northern hemi-

sphere insolation maxima, and minimum values to insolation minima during the same period. With these data on hand, we purpose La-Niña-like glacial climate triggering a northward shift in the mean position of the ITCZ resulting in increased (decreased) winter precipitation over the northern (southern) Sumatra.