Did Polar Regions modulate glacial-interglacial transitions in the northern Indian Ocean

Earth’s climate oscillated between short, warm interglacial and long, cold glacial intervals during the Quaternary. The changes in insolation due to a variation in eccentricity, precession and obliquity are the major factors responsible for glacial-interglacial transitions. The changes in the extent of huge Polar ice-sheets, as a result of insolation, are suggested as the pace-makers of the glacial-interglacial transitions at ~100 kyr periodicity. The mechanism driving the glacial-interglacial transitions is, however, debated. Although atmospheric CO2 is a key link in warming during deglaciation, the lead-lag relationship between warming and increase in CO2 is ambiguous. A couple of past seawater temperature records from the northern Indian Ocean, has a clear lead of warming over the rise in atmospheric CO2 during the last glacial-interglacial transition. In a new multi-decadal record of the last glacial-interglacial transition reconstructed from the central equatorial Indian Ocean, the first phase of significant deglacial warming is synchronous with a rise in local summer insolation. This phase completely predates the rise in global atmospheric CO2. Incidentally a large increase in upwelling and a resultant rise in CO2 outgassing from the northern Indian Ocean, accompanies this first phase of deglacial warming. The implications of this record in the global glacial-interglacial transition will be discussed in the talk.