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The last deglaciation in NE India reconstructed from a stalagmite from Mawmluh cave

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Stalagmite MAW-6 from Mawmluh cave, Meghalaya, provides a continuous, decadally resolved δ^{18}O record of the last deglaciation in NE India. 10 high-precision U/Th dates constrain the growth of stalagmite MAW-6 to the period between 16.3 and 6.3 kyr BP, with dating uncertainties between ± 14 and ± 47 years. Meghalaya is affected by the Indian Summer Monsoon (ISM) and experiences heavy rainfall during the summer, while winters are very dry. Monitoring data shows that stalagmite δ^{18}O in Mawmluh cave reflects ISM rainfall variability: lower $\delta^{18}O_{rainwater}$ values are recorded during wetter periods, while higher $\delta^{18}O_{rainwater}$ values indicate dry periods. Since $> 80\%$ of the annual precipitation falls during the ISM, the δ^{18}O of the drip water (and thus also the stalagmite δ^{18}O) is biased towards the ISM season; this led us to interpret $\delta^{18}O_{carbonate}$ as ISM proxy. MAW-6 records notable climatic changes during the last deglaciation, with pronounced positive excursions during Heinrich event 1 (H1) and the Younger Dryas (YD), and more negative δ^{18}O values during the Bølling-Allerød interstadial and at the beginning of the Holocene. The chronology during the YD is well constrained by 4 U/Th ages with errors between ± 34 and ± 46 years. The timing of the event is synchronous within dating uncertainties to the YD in the North Atlantic region and in South China. The isotopic shifts in δ^{18}O at the end of both the YD and H1 are remarkable (ca. 5‰). We argue that climatic changes in both, the North Atlantic region and NE India, are strongly linked via atmospheric teleconnections, resulting in shifts in the position and strength of the westerlies, the strength of the NE winter monsoon, and in differences in ISM rainfall amount and/or intensity. The role of the Tibetan High for climatic changes in NE India is also discussed, since minor episodes of glacial advance in the Himalayan mountain range could hypothetically influence the weather patterns in the study area.