

Kurosaki, Y., A. Yatagai, and A. Sugimoto, 2026: Isotopic Signatures in Precipitation over the Southern and Central Tibetan Plateau Controlled by Active and Break Phases of the Indian Monsoon. *J. Meteor. Soc. Japan*, **103**, <http://doi.org/10.2151/jmsj.2025-038>.

Plain Language Summary: To provide valuable observational evidence that contributes to improving isotope-enabled models and the interpretation of past climate variability, we analyzed the relationship between the temporal and spatial variations in precipitation associated with the active and break phases of the Indian monsoon and the stable isotopic compositions of precipitation over the southern and central Tibetan Plateau. Our findings reveal the high $\delta^{18}\text{O}$ values were observed during active phase of the Indian monsoon. During the active phase of the Indian monsoon, precipitation in south of the Himalayas was reduced compared to the break phase. This limited the rainout of heavier isotopes from water vapor, potentially resulting in elevated $\delta^{18}\text{O}$ values. We suggest that the importance of considering the active and break phases of the Indian monsoon when interpreting isotopic variations in precipitation over the southern and central Tibetan Plateau.

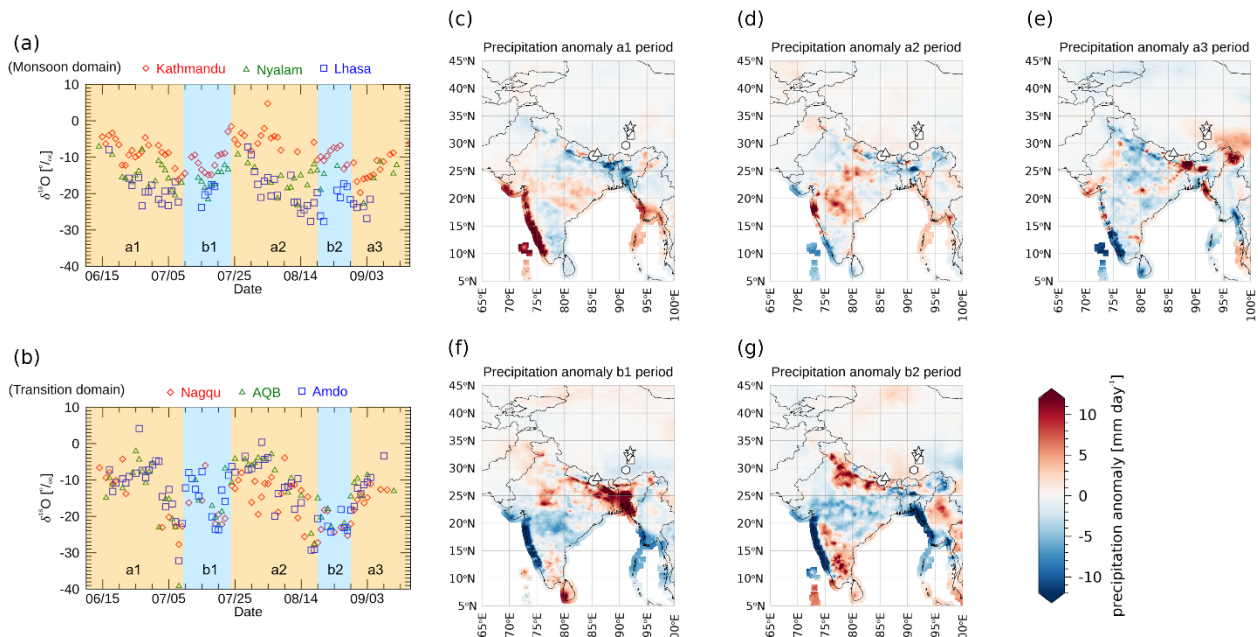


Figure 1. Temporal variations in $\delta^{18}\text{O}$ in precipitation during the 1998 Indian monsoon (a, b), and mean precipitation anomalies during the active (c–e) and break (f, g) phases of the Indian monsoon. Orange and blue shaded areas of (a, b) indicate the active (a1–a3) and break (b1, b2) phases, respectively. Site positions of (c–g) are indicated by a white circle (Kathmandu), triangle (Nyalam), hexagon (Lhasa), square (Nagqu), inverted triangle (AQB), and star (Amdo).

- Precipitation $\delta^{18}\text{O}$ was relatively higher during the active phase than during the break phase.
- During the active phase, reduced rainfall south of the Himalayas may have limited the rainout of heavy isotopes, allowing higher $\delta^{18}\text{O}$ vapor than the break phase to reach the Tibetan Plateau.
- During the break phase, the enhanced orographic rainfall along the windward slopes of the Himalayas may have caused a progressive decrease in $\delta^{18}\text{O}$ values toward the north.