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Synchronization patterns of heavy rainfalls between North India and the Sahel Zone on daily timescales

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The dominant drivers of boreal summer precipitation variance in tropical and subtropical regions are the Asian and the North African Summer Monsoon.

Despite extensive investigation into regional precipitation dynamics, the interaction between these monsoon systems remains hardly understood.

This study employs a complex climate network approach based on extreme rainfall events to uncover synchronously occurring heavy rainfall patterns.

We identify a synchronization trend during the peak monsoon period in July, linking the rainfall in North India to that in the Sahel Zone.

Our findings indicate that La Niña-like conditions in combination with the Boreal Summer Intraseasonal Oscillation (BSISO) foster the synchronization.

The convective clouds are subsequently transported by an intensified tropical easterly jet toward North Africa, introducing unusual convection over the Sahel region.