

## Submitted Abstract

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## Abstract

The interplay of the Indian Monsoon and the Himalayas is vital to many climatological aspects of the Himalayan foothill and foreland regions. A unique climate feature in the Himalayan foothill and foreland regions is a bi-modal diurnal cycle of precipitation with high rainfall amounts in the afternoon and around midnight. The reason for this night-time precipitation maximum is not yet fully understood, and current climate models do not well represent the regions' diurnal cycle of precipitation. Nevertheless, estimation of realistic spatiotemporal precipitation patterns is crucial for the climate community (e.g., for impact modeling). This study reviews discussions in literature, available observational findings (ERA5, CMORPH, and IMDAA), and simulation results with the regional climate model (RCM) and convection-permitting models (from the CORDEX FPS CPTP initiative). Our COSMO-CLM simulations indicate that the model is not able to recover the nighttime's precipitation behavior with currently typical horizontal RCM grid-spacings (e.g., 20 or 50 km), but it can do so with convection-permitting grid-spacing (~3 km) which sufficiently resolves the relevant orographic thermal wind together with the moist monsoonal flow characteristics in the area.