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## Study on the precipitation gradient characteristics in the high mountains of southern Tibet

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Precipitation usually is the main source of river discharge in the high mountain headwater areas and therefore as a key parameter in hydrological modelling. However, spatiotemporal distribution of precipitation in the remote high mountain headwater areas on the Tibetan Plateau (TP) has been poorly described due to the scarce meteorological stations located in high elevations. A series of rain gauges were set-up in three catchments of the southern TP to study their precipitation (liquid) gradient (PG) characteristics under different precipitation intensity grades (PIG) during the monsoon season (July to September) from 2013 to 2016. Results showed that the average PG varied during 0.71 to 0.82 mm·100 m<sup>-1</sup> in the three study catchments for the total (non-intensity-graded) precipitation during the monsoon, and varied up to 2.4 times under different PIGs. Besides, PGs were all strongly correlated to precipitation amounts in the three study catchments, these patterns were relatively persistent among different years but varied among different catchments. Generally, the correlations between PG and precipitation amount showed a steep positive slope under fine precipitation grade but became flat or even negative with stronger PIG. We concluded that the precipitation in southern Tibet was influenced more by valley-scale convection than by large-scale vapor circulation during the monsoon season.