

EGU21-13259

<https://doi.org/10.5194/egusphere-egu21-13259>

EGU General Assembly 2021

© Author(s) 2022. This work is distributed under the Creative Commons Attribution 4.0 License.



## Regionalization of seasonal precipitation over the Tibetan Plateau

Hui-Wen Lai<sup>1</sup>, Hans W. Chen<sup>2</sup>, Julia Kukulies<sup>1</sup>, Tinghai Ou<sup>1</sup>, and Deliang Chen<sup>1</sup>

<sup>1</sup>Department of Earth Sciences, University of Gothenburg, Sweden

<sup>2</sup>Department of Physical Geography and Ecosystem Science, Lund University, Lund, Sweden

The Tibetan Plateau (TP) is the “water tower” of Asia and is the origin of most major rivers that provide water resources supporting countries in Asia. Changes in precipitation over the plateau play an important role in the water management in those areas, but the spatiotemporal variations of the precipitation over the TP are not well understood mainly because of the sparsely distributed in-situ observation sites. This study takes advantage of the newly available high-resolution ERA5 reanalysis and the Global Precipitation Measurement satellite product IMERG together with in-situ observations to characterize the seasonality of precipitation over the TP using a self-organizing map algorithm fed with precipitation data from 2000 to 2019. Specifically, this study aims to (1) identify regions with distinct seasonality in precipitation, (2) determine the interannual variability in the classification and regional precipitation, and (3) explore the roles played by large-scale atmospheric circulations on the seasonality of regional precipitation. The classification reveals three major precipitation regimes in the TP centered at the western, southwestern, and eastern plateau. On a year-to-year basis, the western region is relatively robust, while the southwestern and eastern regions tend to shift mainly between the central and northern TP. A composite analysis shows that the western region experiences larger amounts of precipitation in winter and early spring when the westerly jet is anomalously strong to the north of the TP. Precipitation variations in the southwestern region are associated with intensity changes in the South Asian High and Indian summer monsoon. The precipitation in the eastern region is correlated with the Indian summer monsoon and anticyclonic circulation over the western North Pacific. Our findings provide a better understanding of the regional and interannual variations of precipitation regimes over the TP, and could help to interpret future changes in precipitation regimes due to climate change.