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Investigation of statistical relationship between extreme precipitation and global climate indices in South Korea

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The relationship of the global climate indices and hydro-meteorological variables such as precipitation has been analyzed in various ways, but still need to be investigated for understanding and managing water resources. On the basis of the atmospheric-oceanic circulations, statistical findings could be an important indicator to support the physical phenomenon of the climate system. This study aims to reveal the relationship between the global climate indices and extreme precipitation in summer season considering the lagged interannual variability. In the application, (1) the monthly precipitation patterns at the selected stations in South Korea were presented by empirical mode decomposition method which can extract an original data series into a finite number of oscillatory modes; (2) correlated climate indices showing significant periodicity with the extreme precipitation of summer season were founded by statistical methods. The results suggested that the major drivers to the extreme precipitation and their periodicity are related to the long lagged climate indices. Finally, the findings of this study are able to provide a basis for predicting the extreme precipitation of summer season considering the global scale influences on South Korea.