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Long term spatial and temporal study of precipitation and temperature over Monsoon Asia

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Climate has changed since the industrial revolution as a consequence of increasing emissions of greenhouse gases into the atmosphere. As a result of rising temperature and changes in precipitation, the hydrological regimes are changing as well. Long term studies (spatial and temporal) of the weather parameters over any region is important to understand the impacts of climate change and in proper planning for the risk-management of the natural disasters. In this context, a detailed analysis of temperature and precipitation over Monsoon Asia (60°E-150°E, 15°S-55°N) on daily, monthly, seasonal and annual time scales for the period 1973-2007 (35 years) is carried out. The Asian Precipitation-Highly-Resolved Observational Data Integration (APHRODITE) 0.25 degree-gridded data product versions V1204R1 and V1101 for temperature and precipitation, respectively are utilized. The long and short term variability alongwith the trend relationships in temperature and precipitation over the chosen continental region were examined using the time series and spectral analysis approaches. The results obtained from the Fourier analysis, linear regression and auto-regressive integrated moving average (ARIMA) based methodologies are discussed and presented. The results of precipitation analysis using APHRODITE were also compared with the Tropical Rainfall Measuring Mission (TRMM), Global Precipitation Climatology Centre (GPCC), Climate Research Unit (CRU) and reanalysis products.