

New Record-Breaking Frequency of Annual Maximum Daily Precipitation of 58 stations in the whole Japan, an increasing of extreme values.

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The changes in daily temperature extremes in global scale have affected the weather and climate extreme events when there is an increase of greenhouse gas GHG compare to the industrialization in the 19th century (IPCC, 2014). Yamada et al. (2014) illustrate that the water vapor and convective instability follow the Clausius-Clapeyron-like rate of change with 99th percentile hourly precipitation intensity. Lehmann, J. et al. (2015), on another hand, studied globally the characteristic of precipitation change anomaly using a relation of the Clausius-Clapeyron model. By the way, the climate change tends to include another factor, which is more statistical base. The theory of record values in independent and identically distributed (i.i.d) random variable is studied more extensively and is more applicable with an assumption of stationary climate. The Clausius-Clapeyron equation is then also applicable base on the thermodynamic term which illustrates the relation of the temperature, vapor pressure and precipitation formation characteristic which also mentioned in the above previous studies. At the first stage, 58 stations of AMeDAS data with 117-years period across Japan are used for this analysis. The result shows that mean long-term precipitation of these 58 stations is higher than the mean value from theory i.i.d random variable of stationary climate. From this result, it can be implied that the change of precipitation in Japan is influenced by the drift term either of climate change or the heat island. In this case, the Clausius-Clapeyron equation is applied to identify the temperature term of change. This study tries to formulate a theory which more statistical base of climate drifts, non-stationary and non-identically to extreme events in accordance with time series. Clausius-Clapeyron Model and the Linear Drift Model is considered to form an empirical stochastically based on climate trend.

Keywords: Clausius-Clapeyron, New record Breaking, i.i.d