An Insight into the Influence of Various Meteorological Parameters of Indian Ocean on the Intraseasonal Variation of Northeast Monsoon of India

CHARLOTTE[1], GIBIES GEORGE[2], RUCHITH[2] and SUGUNA YESODHARAN[1]

[1] *Cochin University of Science and Technology, Kochi-682022,*

[2]*Indian Institute of Tropical Meteorology, Pashan, Pune-411 008*

The intraseasonal time series analysis of winter north east monsoon of southern peninsular India is done from the area average daily rainfall for ninety two days comprising from first of October to 31st December. The study revealed that the number of intraseasonal oscillation varies from one to five times in most of the years. In the analysis period those years that displayed more than fifteen days of active rainfall at a stretch [with daily rainfall mean (DRNM) excess than climatological seasonal mean (CRNM) value], followed by another fifteen days of break of monsoon with no rainfall is categorized as 'Single Long Pulse Years'. Those type of years in which northeast monsoon rainfall pattern showed four or more short spells of short period rain (less than fifteen days) are classified as 'Multiple Short Pulse Years'. When the variation in BayT (SST of specific box of Bay of Bengal) is very slow with long period or when BayT runs cool it definitely leads to single long pulse mode of northeast monsoon. On the other hand if BayT remains high ArsP (Sea Level Pressure of a specific box of Arabian Sea) puts forth a control on the intraseasonal variation of northeast monsoon and it will ultimately lead to multiple mode of oscillation. Generally years of strong influence of BayT is associated with positive dipole mode index (DMI).These years are noticed with strong easterly zonal wind anomaly in the equatorial central Indian Ocean. Strong La Nina years with negative anomaly of SST on equatorial east pacific (NinoT) displayed active correlation of BayT on Indian winter monsoon rainfall Strong warm pool formation on Indonesian coast, negative DMI in Indian Ocean and prevalence of westerly anomaly in zonal wind are favorable features for the upper hand of ArsP in deciding the multiple pulse
oscillation mode of post monsoon.

The study showed 90% statistically significant intraseasonal correlation between

BayT and rainfall for 34 years of the study period whereas twenty years displayed 99% correlation. In the case of ArsP, rainfall showed 90% significant intraseasonal correlation for 35 years and half of them with 99% correlation.

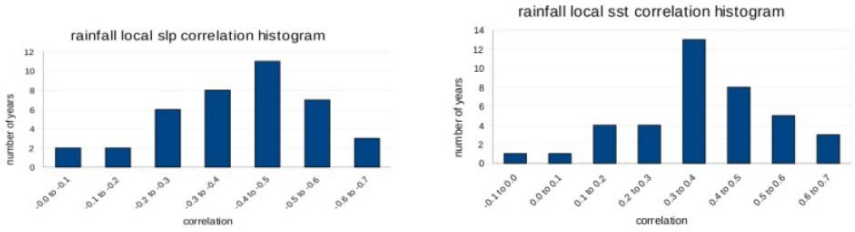
X= DRNM- CRNM

Y=ArsP- dimatological mean ArsP

Z=BayT- dimatologicalmean BayT

$$Correlation\ (x,y) = \frac{\frac{1}{n}\sum_{i=1}^{n} X_1 y_1 \; - \; \frac{1}{n}\sum_{i=1}^{n} x_1 \frac{1}{n}\sum_{i=1}^{n} y1}{\sqrt{(\frac{1}{n}\sum_{i=1}^{n} x_i^2 - (\frac{1}{n}\sum_{i=1}^{n} x_i)2) \times (\frac{1}{n}\sum_{i=1}^{n} y_i^2 - (\frac{1}{n}\sum_{i=1}^{n} y_1)2)}} \qquad (1)$$

$$Correlation\ (x,z) = \frac{\frac{1}{n}\sum_{i=1}^{n} x_1 z_1 - \frac{1}{n}\sum_{i=1}^{n} x_1 \frac{1}{n}\sum_{i=1}^{n} z_1}{\sqrt{(\frac{1}{n}\sum_{i=1}^{n} x_i^2 - (\frac{1}{n}\sum_{i=1}^{n} x_1)2) \times (\frac{1}{n}\sum_{i=1}^{n} z_i^2 - (\frac{1}{n}\sum_{i=1}^{n} z_1)2)}} \qquad (2)$$



Keywords: northeast monsoon, post monsoon season, intraseasonal correlation, rainfall, Sea Surface Temperature, Sea Level Pressure, zonal wind anomaly

[1]*Email:charlottesajan@gmail.com, Phone: 0484-2540335.*

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