Understanding the intraseasonal variability over Indian region and development of an operational extended range prediction system

RAJIB CHATTOPADHYAY, SUSMITHA JOSEPH, S. ABHILASH, RAJU MANDAL, AVIJIT DEY, R. PHANI,
SARANYA GANESH, MANPREET KAUR, D. R. PATTANAIK* and A. K. SAHAI

Indian Institute of Tropical Meteorology, Pune – 411 008, India

* India Meteorological Department, New Delhi – 110 003, India

e mail : rajib@tropmet.res.in

ABSTRACT. Extended range forecast of sub seasonal variability beyond weather scale is a critical component in climate forecast applications over Indian region. The sub-seasonal to seasonal (s2s) project, undertaken by WCRP, started in 2013 to improve the forecast beyond weather scale which is a challenging gap area in research and operational forecast domain. The primary objective of this s2s project is to provide the sub-seasonal to seasonal forecast in various lead times.

Extended range forecast project at Indian Institute of Tropical Meteorology (IITM) is envisioned more than a decade ago in this way, keeping in view of the demands from the stakeholders to create a robust research background required for improved delivery of operational forecast in this scale. Extended range forecast implies an outlook with a lead-time of 2-3weeks. Several efforts have been undertaken to improve the extended range forecast in the past decade or so at IITM. The current study summarizes the development of extended range prediction system for operational implementation at IMD. The research and development that lead to the development of extended range prediction are summarized at first. It describes the efforts that were undertaken to establish the statistical properties of monsoon intraseasonal oscillations, establish the predictability horizon, represent the oscillations in state-of-art climate models and finally develop the latest state-of-art forecast technique. This technique is now operationally implemented at India Meteorological Department.
The study then summarizes potential applications of extended range forecast in meteorological perspective. The primary use of this forecast system is the development of an operational country-wide forecast product in the extended range time scale. The application of this forecast can be made in several allied fields like agro-meteorology, hydrometeorology, health sector etc. A brief discussion is made relating the potential use of this forecast to these fields.

Key words – ISO, MJO, MISO.