Date: April 11

Time: 11:00 AM

Location: Maryland Hall 110

Speaker: Dr. Suneet Dwivedi

Johns Hopkins University

Title:"Empirical rule for extended range prediction of duration of Indian summer monsoon active and break spells"

Abstract

Skillful and timely prediction of the duration of active and break spells of intraseasonal Indian summer monsoon rainfall is of immense importance and has great societal impact. Applicability of the regime transition rules for the Lorenz model in predicting the duration of monsoon breaks is explored. Using several indices of the observed summer monsoon intraseasonal oscillation (ISO), it is shown that the peak anomaly in an active regime can be used as a predictor for the duration of the subsequent break spell. It is also found that the average growth rate around the threshold to an active condition can be used as a predictor of the peak anomaly in the active spell. Average growth around the threshold to an active condition can give useful prediction of the duration of the following break, on an average, about 23 days (38 days) in advance of its commencement (end). To explore whether such predictors also exist for different modes at different time scales into which the ISO raw data can be resolved, ISO indices are decomposed into their respective intrinsic mode functions (IMFs) using Empirical Mode Decomposition (EMD) technique. For each ISO index, it is shown that for most of the dominant IMFs, the peak in the active (break) regime may be used as a predictor for the duration of the subsequent break (active) regime. To gain some insight into the nonlinear dynamical character of these ISOs, a stochastically forced Lorenz model is proposed as a paradigm model for the monsoon ISOs. Results obtained from this model are similar to those obtained from the observed dataset.