



UNIVERSITY
of HAWAI'I
MĀNOA

Department of Atmospheric Sciences Seminar Announcement

Department of Atmospheric Sciences, S.O.E.S.T., University of Hawai'i at Mānoa
2525 Correa Road, HIG 350; Honolulu, HI 96822 ☎956-8775



Improving ENSO forecasts using Bayesian model averaging

Professor Pao-Shin Chu

Department of Atmospheric Sciences
University of Hawai'i at Mānoa

Date: Wednesday, October 2, 2019
Refreshments: 3:00pm at MSB courtyard
Cookies, Coffee & Tea Provided
Seminar Time: 3:30pm
Location: Marine Sciences Building, MSB 100

Abstract:

The Bayesian Model Averaging (BMA) method was developed to combine the NCEP/CPC three statistical and one dynamical forecast products of seasonal Ocean Niño Index (ONI) from 1982 to 2010. The BMA weights were derived directly from the predictive performance of the combined models. The highly efficient expectation–maximization (EM) algorithm was used to achieve numerical solutions. We show that the BMA method can be used to assess the performance of the individual models and assign greater weights to better performing models. The continuous ranked probability score is used to evaluate the BMA probabilistic forecasts. As an elaboration of the reliability diagram, the attributes diagram that includes the calibration function, refinement distribution, and reference lines is also used. The combination of statistical and dynamical models is found to provide a more skillful and reliable prediction of the ONI than only using a suite of statistical models, a single dynamical model, or the equally weighted average forecasts from all four models. Probability forecasts of El Niño events based only on winter ONI values are reliable and exhibit sharpness. In contrast, an under-forecasting bias and less reliable forecasts are noted for La Niña.