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ATMO Dept Seminar Series, Wednesday, 12/04/2024, at 3:30 PM in MSB 100
1 message

Department of Atmospheric Sciences <metdept@hawaii.edu>   Wed, Nov 27, 2024 at 11:40 AM
To: Department of Atmospheric Sciences <atmo.dept@hawaii.edu>

Please join us for a Fall seminar in Atmospheric Sciences. It will be hybrid (in-person and online) in MSB 100 and via Zoom for remote attendance.

When: Wednesday, December 4, 2024, at 3:30PM HST
Where: MSB 100 (Marine Sciences Building, UH Manoa Campus) and Zoom

Zoom Invitation Link: https://hawaii.zoom.us/j/94517824033
Meeting ID: 945 1782 4033
Passcode: 941064

Explained predictions of strong eastern Pacific El Niño events using deep learning

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ABSTRACT

Global and regional impacts of El Niño-Southern Oscillation (ENSO) are sensitive to the details of the pattern of anomalous ocean warming and cooling, such as the contrasts between the eastern and central Pacific. However, skillful prediction of such ENSO diversity remains a challenge even a few months in advance. Here, we present an experimental forecast with a deep learning model (IGP-UHM AI model v1.0) for the E (eastern Pacific) and C (central Pacific) ENSO diversity indices, specialized on the onset of strong eastern Pacific El Niño events by including a classification output. Testing with historical and observational data shows the model can match the skill of leading climate models for eastern Pacific predictions, where it performs particularly well in forecasting the onset and evolution of events like the extreme 1997–1998 El Niño. We find that higher ENSO nonlinearity is associated with better skill, with potential implications for ENSO predictability in a warming climate. Explainable AI (XAI) techniques provide insights into the physical drivers of these forecasts, improving their interpretability and operational relevance. By focusing on operational simplicity and observable inputs, this approach makes ENSO predictions more accessible.

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