

# El Niño Prediction by Using a 4 Dimensional Variational Approach

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The enormous societal importance of accurate seasonal-to-interannual (S-I) forecasts has been recognized. Four-dimensional variational (4D-Var) coupled data assimilation is promising tool to make an advanced initialial conditions and to resolve uncertainties of model parameters for enhancement of S-I prediction skill. We have carried out wide variety of hindcast experiments by using a 4D-Var coupled data assimilation system, to investigate the potential ability of El Niño prediction. Here we put stress on the role played by tropical seasonality, which is changing on pentadal to decadal timescales, in the evolution of the El Niño. The hindcast results show that El Niño predictions will inevitably be uncertain if this change is neglected.

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