The precursors of weather and climate events and their evolutions are problems of importance in both dynamical meteorology and climate dynamics. And the spacial patterns of the initial errors of a prediction model and their evolutions are a central problem in the studies of predictability of weather and climate. In this study, we investigate the similarities between optimal precursors (OPR) of ENSO (blocking), which are defined to be the initial signals that will develop into a ENSO (blocking) event most probably under certain constraint conditions, and the optimally growing initial errors (OGR) in their onset prediction, by using an approach called "conditional nonlinear optimal perturbation (CNOP). The CNOP is a natural extension of singular vector into the nonlinear category, which was proposed by the authors.

It is found that the optimal precursors of ENSO (blockings) possess high similarities with the corresponding optimally growing initial errors. Such similarities are not only between the spacial patterns of OPRs and OGRs, but also between their evolutions. These similarities suggest that OPRs and OGRs possess common evolution dynamics, which increase our understandings on both OPRs and OGRs. Besides, the spacial patterns’ similarities also provide a sensitive area, which indicates a possible application in targeted observations for ENSO (blockings) prediction: intensive observations in such targeted area bear efficiency of catching the signals and reducing the initial errors which yield the biggest uncertainty of the predictions.