



## **Fixed points, stable manifolds, weather regimes and their predictability**

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In a simple, one-layer atmospheric model, we study the links between low-frequency variability and the model's fixed points in phase space. The model dynamics is characterized by the coexistence of multiple "weather regimes". To investigate the transitions from one regime to another, we focus on the identification of the stable manifolds associated with the fixed points. We show that these manifolds acts as separatrices between regimes. We localize each manifold by making use of several tools arising from the meteorological applications of nonlinear dynamics, namely "bred vectors" (BVs) and singular vectors (SVs). These results are then verified in the framework of ensemble forecasts issued from "clouds" (ensembles) of initial states. The divergence of the trajectories allows us to establish the connections between zones of low predictability and the geometry of the stable manifolds.