

assesses the added value of new parallel batches of perturbed forecasts for Sept. 18. The chosen criterion limit of $\rho \geq 99\%$ was attained after 285 forecasts. The spectrum and cumulative spectrum of the resulting error covariance eigenvalues are described on Panels (b) and (c), respectively. An important result for the present approach is that the dominant (about first 50) eigenvalues decay faster than an exponential.

Fig. 14 illustrates the four dominant error vector forecasts for Sept. 18. They explain 25% of the error variance (Fig. 13) of the field forecast (Fig. 12a). Since model errors are assumed null, these vectors only contain nonlinearly evolved predictability uncertainties, of initial conditions illustrated by Figs. 9–11. The first vector is associated with

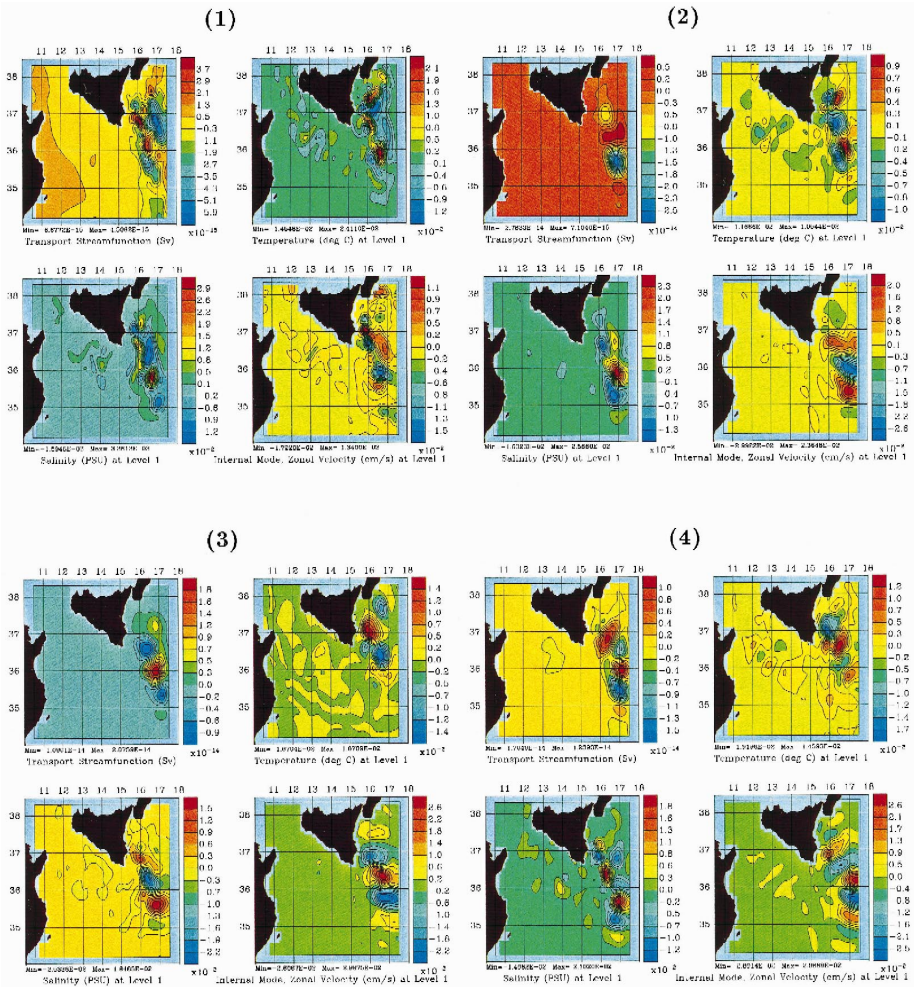


Fig. 14. Multivariate four dominant eigenvectors of the normalized, dominant error covariance forecast for Sept. 18. The Panel numbers indicate the vector numbers. The non-dimensional surface fields shown are as indicated below each plot.