



Fig. 16. Initial PE variability covariance estimate between the surface temperature at (36.53°N, 13.40°E) and the other state variables. The first and tenth level components of a row of the covariance \mathbf{P} on Sept. 15 (size $299,052 \times 299,052$) are shown. Panel (a) shows the surface values, Panel (b) the values for level 10.

influence S , ψ , \hat{u} and \hat{v} according to the structures of Fig. 16. Such structures would be on the LHS of the gain \mathbf{K}^P (Section A.2), extrapolating the data residuals onto the PE state vector.

Fig. 17 is as Fig. 16, but for the Sept. 18 forecast. It exemplifies the covariances that extrapolated the Sept. 18 data residuals in the analysis of Fig. 12d. The nonlinear variations of variability have modified the initial structures (Fig. 16). The surface scales