



Fig. 5. Surface initial conditions for September 15, 1996. The salinity and temperature fields are obtained by objective analysis. The internal velocity and barotropic transport stream function are computed by adjustment PE integrations starting from velocities in geostrophic balance.

2.4.1. ESSE scheme

The present estimation approach reduces the error statistics to multivariate, time-variant error subspaces (ESs). Its geophysical motivations and rationale are given in (Lermusiaux, 1997) and (Lermusiaux and Robinson, 1998). In the minimum error variance context, the consistent ESs are characterized by the dominant eigendecompositions of error covariance matrices, or in other words, by dominant error empirical orthogonal functions (EOFs) and coefficients. At assimilation times, the data and forecast are then combined by minimizing the a posteriori variance in the ES forecast, in accord with the full dynamics and past measurements, and their respective dominant uncertainties. The four-step algorithm employed to carry out this estimation is summarized in Appendix A. The parameters of the melding (measurement model), adaptive error learning and forecast steps are given next. The ES initialization is described later in Section 3.1.