

## **Technique of data assimilation on the basis of the Kalman filter theory**

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The data processing of real observation over atmospheric state is the major problem at studying the processes in an atmosphere. Now meteorological data processing in the main prognostic centers of the world is carried out on the basis of the data assimilation systems. There are two approaches to a problem of data assimilation: variational and dynamical-stochastic (Kalman filter). The modern data assimilation systems based on the variational approach (4DVAR) are easier solved on the computer as in them variability of the forecast error covariances is not taken into account. Besides at the variational approach the estimation of an initial condition is made according to assimilation over the limited interval of time while Kalman filter consists in consecutive estimation of an atmospheric state on again acting data. The algorithm of data assimilation based on Kalman filter, naturally generalizes the data assimilation systems representing a cycle the forecast - the analysis. Essential difference of Kalman filter from these systems is that to this cycle procedure of calculation of the forecast error covariances of estimated fields is added. This procedure because of high dimension of considered matrixes can not be realized in full statement. In work the opportunity of application in a data assimilation problem suboptimal algorithms in which for calculation of the forecast error covariances the simplified models are used is investigated. Main principles of obtaining of such simplified models are considered. Results of numerical experiments on data assimilation with application of suboptimal filters in a problem of weather forecast are presented. Work is supported by RFBR grant 04-05-64481.