

GOME validation using data assimilation

A.J.M. Piters, P.F. Levelt, M.A.F. Allaart and H.M. Kelder

Royal Netherlands Meteorological Institute (KNMI),

P.O. Box 201, 3730 AE, De Bilt, The Netherlands

piters@knmi.nl

<http://www.knmi.nl/KLIMAAT/OZON/ozone.html>

Abstract

A two-dimensional dynamical assimilation model (AMK) is used to derive error characteristics of the GOME total ozone column observations. Data assimilation is a technique which combines observations with an initial guess of, in this case, the global ozone distribution in such a way that it results in the most likely global ozone distribution at a specific time. To do this, it makes use of known error characteristics of the observations and of the model which produces the initial guess. In this paper data assimilation is used as a tool for validation by assuming that the observations, in this case GOME total ozone observations, are perfect. Since, obviously, they are not, the results obtained with these wrong assumptions enables us to derive the true value of the random observational uncertainty for the GOME measurements, and to derive systematic dependences of the error on instrumental and atmospheric parameters.