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## Introduction

Data assimilation is a major focus of the Centre's research and operational activity. Substantial theoretical and experimental progress in recent years has led to major developments and operational implementations in variational assimilation, and the formulation of plans for future investments in simplified Kalman filtering. Besides their significance for the data assimilation process *per se*, these developments have impacts on other aspects of numerical weather prediction such as extraction of information from the time history of in-situ and satellite observations, exploitation of tracer information, computational requirements in terms of processing power and architecture, formulation of physical parametrizations, predictability studies and ensemble prediction.

Thus in September 1996 the Centre devoted its annual Seminar to the topic of Data Assimilation, to provide a pedagogical overview of current developments in the subject. The Seminar was followed immediately by a three-day Workshop, to provide a more specific review of research and formulate recommendations for future study concerning non-linear aspects. These proceedings contain the written contributions of the Seminar lecturers and Workshop speakers. They also contain lightly edited reports of three working groups set up at the Workshop covering the topics Assimilation Methods, Representation of Physical Processes, and Observation Operators, Error Statistics and Quality Control.