数学与系统科学研究院

计算数学所学术报告

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报告题目：

Issues in Data Assimilation and Some Possible Solutions

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报告时间：**2011** 年 **10** 月 **26** 日（周三）

下午 **15：00**

报告地点：　科技综合楼三层 **301**

计算数学所小报告厅

Abstract:

Numerical weather prediction (NWP) is one of the most important tools to forecast weather states in the future time, which is widely applied in operational prediction centers in the world. It is made through integrating a prediction model from the initial time to the prediction time, which is actually to numerically solve initial problems of a set of partial differential equations. Therefore, the performance of prediction model and the quality of initial condition (IC) are two essential factors that impact the accuracy of NWP directly.

Following the rapid development of computer technique, prediction models keep being improved on their resolutions and physical processes, and show increasing capabilities to present some important synoptic phenomena. However, ICs control the evolution of the solution trajectory in space and time along with the model equations. It indicates that the quality of IC is more and more important for NWP when the model errors have been decreased continuously, which has paid more and more attention in operational NWPs. Therefore, one of the critical steps for NWPs is to construct efficient methods of producing high-quality ICs.

Data assimilation is the technique by which observations are combined with an NWP product (i.e., the first guess or background forecast) and their respective error statistics to provide an improved estimate (the analysis) of the atmospheric (or oceanic, whatever) state.

In this paper, some frequently-used approaches of data assimilation are concisely introduced and compared, key issues in available data assimilation approaches are analyzed and discussed, and finally some possible solutions to these issues are anticipated.

欢迎大家参加！