

# **ASSIMILATION OF OCCULTATION DATA INTO ATMOSPHERIC MODELS: FUNDAMENTALS, REQUIREMENTS, AND FUTURE KEY APPLICATIONS**

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Atmospheric models do represent a sequence of weather. This is the basic paradigm in their development.

One major consequence out of this paradigm is that atmospheric models must be able to show the same signature as actual measurements of any physical quantity modeled. A method to compare actual measurements and an atmospheric model can be based on data assimilation. During the data assimilation process the models background error can be determined. This error is one component of the error budget of an atmospheric model.

Another aspect of data assimilation is based on the optional possibility of using a 4 dimensional variational assimilation system for sensitivity experiments. This option allows for the analytical derivation of the sensitivity of different model components to measurements and is hence a comprehensive tool for the development of parameterizations of physical processes.

One of the most important parts of information, which is required to be represented well in atmospheric models, is the flow dependent representation of temperature and water vapor. A unique type of measurements in this context are occultation measurements, which globally provide information not only on the vertical distribution, but also on the horizontal distribution of key atmospheric variables.