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Overview of assimilation methods

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The goal of the ECMWF Earth System data assimilation is to provide an accurate and physically coherent description of the state of the atmosphere, ocean, sea ice and land surface as an initial point for our forecasts.

This requires blending in a statistically optimal way information from a huge variety of observations and our prior knowledge about the physical laws of the Earth system, which is encapsulated in our models.

In this lecture we will lay the general conceptual framework on how to achieve this from a Bayesian perspective. We will then highlight the approximations and hypotheses which are required to make the assimilation problem computationally tractable and which underlie the practical data assimilation algorithms which will be described in detail in this training course.

By the end of lecture you should be able to:

- understand the basics of how a geophysical data assimilation system works;
- understand the main approximations and hypotheses which are required to build practical data assimilation algorithms for large geophysical systems

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