

Data assimilation problems and controllability

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Abstract

Data assimilation problems consist in retrieving the value of the solution at some time (everywhere in the domain) for an evolution problem knowing informations on the solution on a subdomain during a period of time. In a classical approach one tries to find the initial data using a Tychonov regularisation. This depends on a regularisation parameter and the problem becomes ill-posed when this parameter tends to zero. We will present a non standard approach, based on Controllability techniques, which enables to retrieve the solution at the final time. A consequence is also to give a sense to the classical approach in a non standard functional class. We will present this method on the heat equation and on a large scale ocean model for which we will give numerical experiments.