The main goal is a method development for analysis of identification errors and finding the best points in the observation’s space from the standpoint of identification errors minimum.

We give attention the following questions:

How to find identification errors dependence on the position of observations for any kind of mathematical models?

Which experiment and measurement conditions guarantee a minimum level of identification errors?

How the optimum observations plan depends from the type of unknowns and functional properties of a model state? In particular, are possible to get general design in case of nonlinear dependence of input-output functions?

What is the optimum observations plan for solid heat properties determination? In particular, is there enough only one internal observation to find heat properties?

It is shown that the regularization method is highly effective for solving the observational design problem in real object described by broad class of mathematical models, polynomial, ODE, PDE. Based on this method, we have proposed an approach by which to analyze comprehensively the properties of an experiment.

We have use this approach to find optimal measurement point, determine the guaranteed identification error, to investigate the sensitivity and identifiability of the model, and to establish the main factors for achieving a manageable identification error.