DISCRETE MOLLIFICATION FOR INVERSE PROBLEMS BASED ON TIME-FRACTIONAL DIFFERENTIAL EQUATIONS

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ABSTRACT. The method of discrete mollification, which is based on a convolution with a truncated gaussian kernel, has been implemented as a regularization tool for inverse problems and as an acceleration mechanism for explicit schemes. The method is particularly useful in combination with space-marching finite difference schemes for the numerical solution of inverse problems related to heat equations. In this talk we present an update on the use of mollification for the numerical solution of some inverse problems associated to one dimensional time-fractional differential equations. The main features are: The fractional derivatives are interpreted in the sense of Caputo, the only available data are noisy and the solution process includes automatic selection of the involved regularization parameters. Error estimates for the numerical solution of the mollified problem and numerical examples are provided.

Keywords: Discrete mollification, time-fractional equation, inverse problem.


REFERENCES


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