

Supraconvergent-superconvergent methods for non Fickian models

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ABSTRACT

In this presentation we study numerical methods for integro-differential initial boundary value problems that arise, naturally, in many applications such as heat conduction in materials with memory, diffusion in polymers and diffusion in porous media. We propose finite difference methods to compute approximations for the continuous solutions of such problems. We analyze stability and study convergence for those methods. We prove a supraconvergent estimate. As such methods can be seen as lumped mass methods, our supraconvergent result is a superconvergent result in the context of finite element methods. Numerical results illustrating the theoretical results are included.

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