EXPLICIT CALCULATION OF SOLUTION AND RECONSTRUCTION OF HEAT SOURCE ON LINEAR PARABOLIC EQUATION

Youjun Deng

1) Department of Mathematics, Inha University, Incheon 402-751, KOREA

Corresponding Author: Youjun DENG, dengyijun_001@163.com

ABSTRACT

We give the existence and uniqueness of the strong solution of one dimensional linear parabolic equation with mixed boundary condition. The boundary conditions can be any kind of mixed Dirichlet, Neumann and Robin boundary condition. We use the extension method to get the unique solution. Then we construct the numerical methods for the reconstruction of source term in linear parabolic equation from final overdetermination. We assume that the source term has the form $f(x)h(t)$ and $h(t)$ is given, which guarantees the uniqueness of the inverse problem for determining $f(x)$. We present the numerical methods for both no boundary and Neumann boundary situations. Moreover, we show that the solution of the boundary conditions problem has the form of the no boundary solution problem by using the extension method. Numerical experiments are done for the inverse problem with the boundary conditions.

Keywords: Linear parabolic equation, Strong solution, Extension, inverse problem, numerical methods

REFERENCES

9. 


