A Semi-Discretized Numerical Scheme for the Solution of a Class of Singular Integro-Differential Equations

Shihchung Chiang and Chia-Ju Tsou
Department of Applied Statistics, Chung Hua University
No. 707, Sec. 2, Wufu Rd., Hsinchu, 30012, Taiwan, R.O.C.
Tel: 03-518-6394 Fax: 03-518-6435
Email: Chiang@chu.edu.tw, m09509006@chu.edu.tw

Abstract

We consider a class of singular integro-differential equations with initial conditions. For this specific type of integro-differential equations, it can be transformed into first order hyperbolic partial differential equations. By applying nonconforming finite element methods on space and keeping time as a variable, we establish a semi-discretized scheme and then use an ordinary differential equation solver for this semi-discretized scheme. We report the numerical solutions of a class of singular integro-differential equations with trivial and nontrivial conditions.