On Numerical Calculation of High Order of Accuracy Operator Splitting Schemes for the First and Second Order Evaluation Problems and Non-Linear Kirchhoff Equation

Mikheil Tsiklauri[a], Jemal Rogava[b]

[a]Missouri University of Science and Technology

[b]Ivane Javakhishvili Tbilisi State University,

I. Vekua Institute of Applied Mathematics

High order accuracy operator splitting schemes are constructed and investigated for the first and second order evolution equations based on semi-group and cosine operator splitting. Also, there is studied Cauchy problem for the second order non-linear evolution equation, that corresponds to abstract analogue of Kirchhoff equation. For this problem locally linear, three-layer semi-discrete scheme is constructed. Stability and convergence of this scheme is proved. Different test problems are solved based on the constructed schemes.