

Use of a Two-Dimensional Operational Calculus for Nonlocal Vibration Boundary Value Problems

I. Dimovski¹, M. Spiridonova²

¹ *Institute of Mathematics and Informatics, Bulgarian Academy of Sciences, dimovski@math.bas.bg*

² *Institute of Mathematics and Informatics, Bulgarian Academy of Sciences, mspirid@math.bas.bg*

Nonlocal boundary value problems for the wave and the beam equations in finite space domains are considered. For solving such problems extensions of the Fourier method and the Duhamel principle are used in the frames of a two-dimensional operational calculus. Explicit formulae of the solutions are derived. These formulae can be used for numerical computation and visualization of the solutions. Examples with use of the computer algebra system *Mathematica* are included.