Numerical simulations of functionally graded fiber reinforced cementitious composite members

Tereza Sajdlová, Petr Kabele

Department of Mechanics, Faculty of Civil Engineering,
Czech Technical University in Prague,
Thakurova 7, 16629 Praha 6, Czech Republic

Abstract

Functionally graded members are relatively new application of fiber reinforced cementitious composites (FRCC). Numerical modeling using finite element method is a suitable tool for analysis of the behaviour and fracture of FRCC and it can simplify the design of functionally graded members. The main goal of this research is the development of a material model for the analysis of structural elements with non-uniform distribution of fiber reinforcement. The main material properties (e.g. the cohesive law) are determined and implemented into the material model. The results of numerical simulations are compared with experimental results. Results of functionally graded FRCC members and homogenous FRCC members are compared, and then the advantages and disadvantages of both groups are discussed.