Computer Algebraic Approximations – Creation of Approximated Solutions of Scientific and Engineering Problems in Symbolic Form

Victor F. Edneral
Institute for Nuclear Physics of Moscow State University, Vorobievy Gory, Moscow, 119899, Russia
edneral@theory.npi.msu.su

Abstract

The report describes a new domain of computer algebra applications – Computer Algebraic Approximations (CAA) which deal with a creation of approximated solutions of scientific and engineering problems in symbolic form. These include Approximate Algebraic Computation (AAC), approximations at a simplification of the original problem before its treating and also building of approximated solutions of the original problem. Methods for treating last two approaches are widely discussed for algebraic equations, ODE and PDE separately. A possible connection between accurate solutions of an approximated problem and approximate solutions of the exact problem is discussed.