Tools for Symbolic-Numeric Solving of Differential Equations with Polynomial Nonlinearity in APS System

V.Bilenko, P.Denisenko, A.Letichevsky, and V. Volkov
Glushkov Institute of Cybernetics of
National Academy of Sciences of Ukraine
Glushkov prospekt 40
252650 Kiev, Ukraine
Email: vlad@d105.icyb.kiev.ua

The presented method gives the optimal by accuracy approximation in Chebyshev metric for Linear Differential Equations with a singular point and Differential Equations with Polynomial Nonlinearity. In the solving process of the last case appears the system of algebraic equations. The technique of Grobner Basis may be applied successfully for finding of roots. Algorithms developed for solving DE have been designed by means of special packages of APS which supports the various computation in a polynomial algebra. The main programming technique used in APS is rewriting-rule-based programming.