Collocation-Variation Approach to Numerical Solution of Differential-Algebraic Equations

M. V. Bulatov[1] **and L. S. Solovarova**[2]

Abstract: In the report numerical methods for solving initial value problems for differential-algebraic equations are proposed. The approximate solution is represented as a continuous vector spline whose coefficients satisfy the collocation conditions stated for a subgrid with the number of collocation points less than the degree of the spline. These equalities are supplemented by the condition of minimum of the square of the norm of this spline in the corresponding spaces. Thus, coefficients of spline are found from solution of quadratic programming problem with equality-constraints. Numerical results for some model problems are presented.

References

1. M.V. Bulatov, N. P. Rakhvalov, L. S. Solovarova, *Numerical solution of differential-algebraic equations using the spline collocation-variation method*, Computational Mathematics and Mathematical Physics, 53(3), pp. 284–295, 2013.

[1,2] Institute for System Dynamics and Control Theory
Siberian Branch of Russian Academy of Sciences (ISDCT SB RAS)
Lermontov str.,134,664033, Irkutsk, Russia
mvbul@icc.ru, soleilu@mail.ru