Section number: 08. Ordinary Differential Equations and Dynamical Systems
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NEW APPROXIMATE HYBRID TECHNIQUE
FOR SOLUTION OF THE LINEAR DIFFERENTIAL EQUATIONS
WITH VARIABLE COEFFICIENTS

The paper is devoted to the new approximate approach for solution of the variational problems which could be reduced to the boundary value problems for linear ODEs with variable coefficients. Generally, the technique is based on the idea of exploiting phase integral (WKBJ) method in conjunction with variational principle.

Thus, in the first step, formal introduction of parameter ϵ into equation of a problem allows to obtain its approximate solution with the help of WKBJ method. For $\epsilon = 1$ this solution has usually unacceptable accuracy. In step two, a subset of the coordinate functions from WKBJ-solution with new "amplitudes" are used for construction so-called hybrid solution, that by special choice of "amplitudes" essentially improves the WKBJ-results. Some model problems are considered.

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