SECTION 2. NUMERICAL SIMULATION OF THREE-DIMENSIONAL PROBLEMS OF EXTERNAL AERODYNAMICS

As mentioned earlier in the book, the numerical simulation approach for solution of equations of viscous gas dynamics on personal computer was developed first for analysis of the laminar supersonic flow over flat axisymmetric bodies (two-dimensional problem), and later it was extended for solution of two-dimensional Reynolds equations. In the following years, due to advances in computer technology, increasing processing speed and RAM, this approach was generalized for simulation of three-dimensional supersonic flows based on unsteady three-dimensional equations of viscous gas dynamics (Bashkin et al., 2002, 2003).

This approach as applied to the three-dimensional perfect gas flow is outlined in the chapter below. The results of numerical simulation of several three-dimensional problems of homogeneous supersonic and hypersonic viscous perfect gas flow over bodies of relatively simple configuration are discussed in the subsequent chapters.