The methods for determination the influence of geometric form of turbulators on the wall flow in the supersonic stream

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Today the turbulators are widely used in the engineering technology such as aviation, jet engines, energetics. For example the turbulators are installed on the airplane wings. In this case the turbulators are stationed in the laminar boundary flow before the point of the supposing breakaway and thus help to reduce the size of separation area. This research is about the problem of using the turbulators in the supersonic stream. In particular the authors propose the methods for determination of influence of geometric form of turbulators on the wall flow in the supersonic layer. These methods are based on tridimensional numerical modeling of flow around the turbulator of given shape. The authors propose some parameters for determination the influence of turbulator on the boundary layer. These are incompressible shape factor–H and sweepout efficiency–Phi. Incompressible shape factor is ratio of displacement thickness to momentum thickness. For determination of these parameters in the computational space it is necessary to build a tridimensional platform on the sufficient distance from the turbulator. The platform settles at right angle to wall and its height is more than boundary-layer thickness delta. These values are calculated on the base of integral parameters of flow such as mass flow rate and impulse passing through this platform. This method allows to compare the turbulators of different forms and geometric sizes. This method is possible to use in cases of any sizes of boundary layer and parameters of oncoming flow.