

## Discontinuous Solutions of the Boundary-Layer Equations

**Anatoly I. Ruban**

*University of Manchester, Manchester, UK*

Since 1904, when the boundary-layer equations were formulated by Prandtl, it was always assumed that, due to the viscous nature of the boundary layers, the solution of the Prandtl equations should be sought in the class of continuous functions. Meanwhile, there are clear mathematical reasons for discontinuous solutions to exist. In fact, under certain conditions they represent the only possible solutions of the boundary-layer equations. In this presentation two examples of such flows will be discussed. The first one represents an unsteady analogue of the well known two-dimensional laminar jet. We assume that the jet emerges from a narrow slit which was initially closed. The results of the numerical solution of the boundary-layer equations show that the jet has a well established front which propagates through initially stagnant fluid with a finite velocity. The second part of the talk deals with hypersonic flow past a delta wing.

[View the extended summary](#)