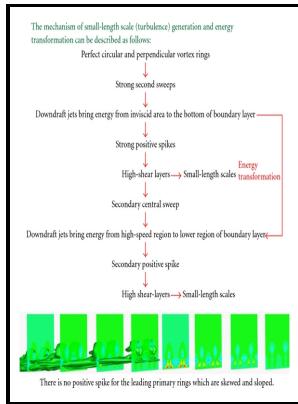


Simulation of boundary-layer transition: receptivity to spike stage

Institute for Computer Applications in Science and Engineering - Simulation of the early stage water flooding through an opening using boundary element method



Description: -

- Boundary layer transition Simulation of boundary-layer transition: receptivity to spike stage

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Direct numerical simulation of transition to turbulence in a supersonic boundary layer

Turbulence mechanism in Klebanoff transition: A quantitative comparison of experiment and direct numerical simulation.

Evolution of the ring

TOLLMIEN, Über die Entstehung der Turbulenz. The flooding process can be divided into the developing flow stage and the stable flow stage. A contemporary flurry of scientific interest in this effect culminated in Sir John Tyndall 1867 deducing that specific SH sounds, directed perpendicular to the flow had waves that blended with similar SH waves created by friction along the boundaries of tubes, amplifying them and triggering the phenomenon of high-resistance turbulent flow.

Numerical Simulation of Instabilities in the Boundary

Non-reflecting boundary conditions for DNS in curvilinear coordinates. Numerical methods for hypersonic boundary layer stability. The relation between roughness and the synchronization point is a candidate to explain roughness delayed transition seen experimentally.

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The quiet DNS approach used in conjunction with controlled disturbances to excite instabilities, as well as SPDM to analyze them, represents a new high-fidelity method of investigating stability and transition in complex three-dimensional flowfields.

Direct numerical simulation of transition to turbulence in a supersonic boundary layer

By using a combination of low-dissipation numerics and a novel shock capturing method, numerical noise is significantly reduced, enabling the simulation and analysis of early stages of the transition process that are governed by the linear growth of small-amplitude disturbances. This is

observed when high enough levels of environmental perturbations free-stream disturbances, surface roughness, etc are present.

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Evolution of a curved vortex filament into a vortex ring. Evolution of the ring-like vortices and spike structure in transitional boundary layers.

Direct numerical simulation of transition to turbulence in a supersonic boundary layer

Through parametric study, we find that the water flooded through the opening earlier is subjected to the gravity for longer time and achieves larger velocity, which results in a slender water spike. SH BLF oscillations in boundary layer fluid along a flat plate must produce SH sound that reflects off the boundary perpendicular to the fluid laminae. Fasel, Investigation of oblique breakdown in a supersonic boundary layer, AIAA Paper, 2007, No.

Simulation of the early stage water flooding through an opening using boundary element method

Shu, Efficient implementation of weighted ENO schemes, J. Complicating the matter is the growing distortion of the mean flow, which can lead to inflection points in the velocity profile a situation shown by to indicate absolute instability in a boundary layer. Zinin, Experiments on instability of supersonic boundary layers, in: Nonlinear Instability of Nonparallel Flows.

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