



# OBLIQUE SHOCK WAVE EVOLUTION WITH DISTANCE FROM ENDWALL IN ARGON AND AIR FOR ROUGH SURFACE

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## ABSTRACT

The influence of reflected shock wave interaction with boundary layer on the flow dynamics behind a reflected shock wave must be known for exact shock-tube measurement of kinetic parameters and for aerodynamic calculations. It is also interesting to investigate methods for such influence reducing.

In the present paper the patterns of development of the bifurcation structure, the dynamics of pressure changing in the near-wall region with increasing Mach number of the incident shock wave and depending on the distance to the endwall were determined for air and argon. Experimental studies were conducted for a cylindrical shock tube 76 mm in diameter for rough surface of measurement section ( $Ra = 60\mu\text{m}$ ). Results were compared with previously observed for smooth surface case. Oblique shock wave characteristics were determined at a location of 50, 150 and 250 mm from the endwall. A moment of passage of the structural elements of the reflected shock wave through measuring sections is determined by measuring of the deflection of a plane-parallel light beam.

Obtained results were compared with the data of other authors for plain surface under similar conditions. The main result is obvious increasing of longitudinal size of bifurcation structure with distance and roughness. The constant increasing of bifurcation structure with distance for rough surface wasn't observed as opposed to results of other authors observed for larger Mach numbers in similar mixtures for larger roughness.

**Keywords:** roughness, oblique shock wave, bifurcation