

Experiments in Fluid Mechanics 2015

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Title of presentation: PIV measurements of a transonic flow over an airfoil
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Abstract: <p>In the course of presented studies an transonic flow filed above an airfoil was investigated by PIV method. The research was conducted as a part of study of Transition Location Effect on Shock Wave Boundary Layer Interaction (TFAST project in 7th EU Framework Programme). The experiments was performed in high speed blow-down wind tunnel in Warsaw Institute of Aviation. In a course of presented study a 2D vector velocity field of the flow over an airfoil for Mach number to 0,7 and 0,75 has been determined. The PIV measurements results was used for determination of the position of the shock wave in relation to the cord of the airfoil for various angles on incidence. As expected the shock moved closer to the leading edge while the angle of incidence was increased. More interestingly, the experimental data revealed an increase in shock oscillation range for angle of incidence between 3° and 5°. Experiments allowed to quantitatively describe the transonic flow field above the airfoil.</p>