

Three decades of SBLI in European Research

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Shock wave – boundary layer interaction (SWBLI) research has very long history, dating back to 1946, when Ackeret, Feldman and Rott carried out and published their famous report. The investigations were done for small Mach numbers below $M=1.3$ and therefore the main conclusion was that in the case of laminar boundary layer SWBLI is building large λ -foot but in the case of turbulent boundary layer the λ -foot is suppressed and the shock wave penetrates directly the boundary layer. This understanding of SWBLI was maintained for quite some time. This paper was a beginning of deeper investigation of the phenomenon by different research centres. It has turned out that at higher Mach numbers the λ -foot is formed, which size depends on the Mach number value.

Within last three decades SWBLI investigation started to involve flow control methods to counteract shock induced separation. An important acceleration of the research was obtained thanks to the financial support of European Commission to the projects within framework programmes from FP4 to Horizon2020, starting from EUROSHOCK project until the present TEAM-Aero.

Carried out research in these three decades included improved understanding of the phenomenon thanks to the application of new experimental and numerical approaches. These allowed to investigate unsteady phenomena within the SWBLI and also the boundary layer state and transition location. Another important aspects are the possibilities of flow control methods to reduce separation which will probably dominate the future research on SWBLI.