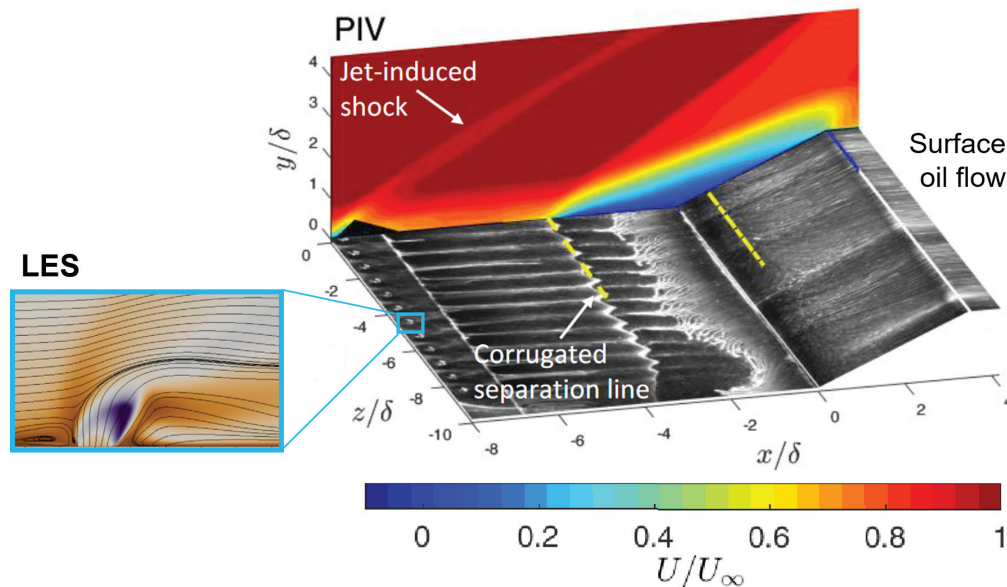


<https://uni-due.zoom-x.de/j/64228670246?pwd=RjVQeFNIUkRKRkpiNVpKYXhJaFNLdz09> (gilt für alle Vorträge)

## Tspanwise-inclined air jets in supersonic cross flow – and their application to control flow separation

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Shock-induced flow separation severely affects the aerodynamic behavior of numerous aerospace transportation and propulsion systems. The phenomenon causes highly unsteady flow fields, which furthermore can induce structural vibrations. Methods to mitigate the associated detrimental effects are thus key for smart system designs. A promising control approach uses arrays of air-jet vortex generators, where small air jets are injected to modify the boundary layer upstream of the separation region. These devices can both reduce the extent of the separation and shift the frequency of the associated unsteadiness. A combined experimental-numerical approach was used to analyze and understand the flow fields forming around individual air jets in supersonic cross flow and jets in control arrays, as well as their resulting separation-control effect. A wide range of influences is relevant here, and their effects on the flow field and the control effectiveness will be discussed on the basis of results from large-eddy simulations (LES) and optical measurements.