





FOR 2895 Symposium

Date:

5 and 6 October 2022

supported by the Deutsche Forschungsgemeinschaft (DFG)

The aerodynamics of transport aircraft at the borders of the flight envelope is characterized by complex interactions and non-linear, unsteady flow phenomena. The underlying physical mechanisms are not fully understood and a prediction of aerodynamic properties, transient loads and aeroelastic behavior is a major challenge that requires the use of sophisticated numerical models and dedicated experiments. Such aspects associated with high speed stall are studied in an ongoing collaborative research initiative that also involves unsteady surface and flow field measurements in the cryogenic European Transonic Windtunnel (ETW). The research is supported by the Deutsche Forschungsgemeinschaft (DFG), the Helmholtz-Gemeinschaft (HGF), the German Aerospace Center (DLR) and Airbus.

First results of this research will be presented and discussed in a two-day symposium. The FOR 2895 presentations will be complemented by selected guest lectures with the aim of fostering academic exchange and collaboration.

The symposium will take place in Stuttgart on October 5 and 6, 2022.



Unsteady Flow Phenomena and High Speed Stall **FOR 2895 Symposium**



Agenda:

Day 1 (5.10.)

12:00-13:00 Arrival & Coffee

13:00-13:10 Welcome: Thorsten Lutz

13:10-13:40

Thomas Lürkens (RWTH Aachen University): Analysis of the Impact of Engine Jet Flow on Shock Buffet

13:40-14:10

Andre Weiner (TU Braunschweig): Transonic Buffet Modeling from Experimentally Noisy Data

14:10-14:40

Johannes Kleinert (University of Stuttgart): Numerical Investigation of High-Speed Stall Phenomena for a Tandem Wing Configuration

14:40-15:10

Marius Herr (TU Braunschweig): Assessment of the Grey Area Problem for Embedded WM-LES on a Nacelle-Aircraft Configuration Under Transonic Flow Conditions

15:10-15:30 Coffee break

15:30-16:00

Guest lecture **Sven Scharnowski** (Universität der Bundeswehr München): Comparison of Shock-Buffet Dynamics on a Supercritical Airfoil With and Without a Pitching Degree of Freedom

16:00-16:30

Guest lecture **Daniella Raveh** (Technion): Shock Buffet and Aeroelastic Stability of the Benchmark Supercritical Wing

16:30-17:00

Daisuke Yorita (DLR): Time-resolved Pressure Sensitive Paint Measurements for Cryogenic Wind Tunnel Tests

17:30-18:30 Visit to CAVE at HLRS (High Performance Computing Center Stuttgart)

19:30-22:00 Dinner

Day 2 (6.10.)

09:00-09:30

Guest lecture **Sebastian Timme** (University of Liverpool): Aspects of Modal Identification in Unsteady Transonic Flow

09:30-10:00

Guest lecture **Jens Nitzsche** (DLR): Transonic Flutter and Buffeting on a typical wing section

10:00-10:30

Guest lecture **Neil Sandham** (University of Southampton): Wall-resolved large eddy simulations of buffet phenomena on airfoil sections

10:30-10:50

Coffee break

10:50-11:20

Sebastian Spinner (DLR): First Assessment of UHBR Induced Wing Lower Side Buffet Effects

11:20-11:50

Marcel Blind (University of Stuttgart): A Time-Resolved Inflow Coupling for Zonal LES

11:50-12:20

Christopher Schauerte (RWTH Aachen University): Experimental Characterization of the Turbulence Structure in Fully-Established Transonic Buffet

12:20-12:50

Rebecca Zahn (TU Munich): Prediction of Wing Buffet Pressure Loads Using a Convolutional and Recurrent Neural Network Framework

12:50-13:00

Closing remarks

Venue and directions:

Internationales Begegnungszentrum der Universität Stuttgart e.V. (IBZ)

Robert-Leicht-Straße 161 70569 Stuttgart

By plane

From the airport, take the S-Bahn S2 or S3 in the direction of the city center to the stop "Universität". (Journey time: 17 minutes). Leave the S-Bahn station in the direction of the "Universitätszentrum" exit. A signpost at the exit of the S-Bahn station will guide you to the IBZ.

By train

From Stuttgart main station take the S-Bahn S1 (Herrenberg/Böblingen/Vaihingen), S2 (Filderstadt/Flughafen/ Vaihingen) or S3 (Flughafen/Vaihingen) to the stop "Universität". Leave the S-Bahn station in the direction of the "Universitätszentrum" exit. A signpost at the exit of the S-Bahn station will guide you to the IBZ.





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Nearby hotels:

Unfortunately, the hotels are well booked at the time of the symposium. However, the venue is easily accessible by S-Bahn in a few minutes from Stuttgart city center, where a larger selection of hotels is available. If you want to stay closer to the venue in Stuttgart Vaihingen you can book e.g. at the ibis styles Hotel:

ibis Styles Stuttgart-Vaihingen Ruppmannstraße 20, 70565 Stuttgart https://all.accor.com/hotel/A6Q4/index.de.shtml

Note

Please take into account possible Covid-related restrictions in place at the time of the event. We suggest wearing a mask indoors.