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Kolloquium für Mechanik

Referentin:	**Dr.-Ing. Cornelia Grabe** Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Institut für Aerodynamik und Strömungstechnik | C2A2S2E - Center for Computer Applications in AeroSpace Science and Engineering, Braunschweig
Datum:	Donnerstag, 14.01.202
Zeit:	16:00 Uhr
Format:	**ONLINE-SEMINAR**
Titel:	**Towards the Border of the Flight Envelope: Strategies to improve RANS Turbulence Models**

Abstract

Today, Computational Fluid Dynamics (CFD) plays an important role in aircraft design. The computation of viscous turbulent flows is based on the Reynolds Averaged Navier Stokes (RANS) equations employing turbulence models with varying complexity. RANS turbulence models are known to perform poorly in critical flow situations occurring at the borders of the flight envelope, e.g. prediction of maximum lift. However, due to the very high Reynolds numbers present in these flows, the application of higher-fidelity simulation methods like LES won't be feasible in the near future. Hence, there is an interest and need to improve existing RANS turbulence models for certain flow phenomena. At the Institute of Aerodynamics and Flow Technology of DLR two different strategies are pursued both relying on high-fidelity data (mostly experimental data due to the high Reynolds numbers). In the first approach, physical laws, e.g. wall laws, are developed which are then introduced into a RANS turbulence model. The second approach employs machine learning methods to reduce the deviation between measured and computed data by introducing data-driven source terms into the RANS model equations. Both approaches are introduced in the talk and their perspectives are discussed.

Alle Interessenten sind herzlich eingeladen.
Prof. Dr.-Ing. Bettina Frohnapfel