# Corner Separations in Linear Compressor Cascades

**Corner Separations in Linear Compressor Cascades**

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## In Short

- Large Eddy Simulation (LES) of corner separation
- Discontinuous Galerkin method
- Validation and development of RANS turbulence and transition models

Corner separations are complex physical phenomena that greatly influence the performance of axial compressors under off-design conditions. They induce instabilities and restrict the compressor operational range. Reynolds-averaged Navier-Stokes (RANS) models often fail to accurately predict the interaction between the boundary layers of the endwall and airfoil. This limitation results in inaccurate predictions of aerodynamic performance, blade loading, and instability mechanisms.

In order to improve the prediction of corner separations by RANS, we propose to conduct large eddy simulations (LES) of a linear compressor cascade at a Reynolds number of 382000 and incidence angles of $4°$ and $7°$. These simulations will be validated with experimental data and will serve as a foundation for the development of advanced RANS models. The simulations will be performed using the flow solver TRACE, which was developed by the DLR and MTU Aero Engines AG. The flow solver uses the discontinuous Galerkin (DG) method, the accuracy of which is of higher order and scales very well on HPC clusters. Suiting the requirements for this project, the implementation of the DG method into TRACE makes TRACE a state-of-the-art highly efficient software.

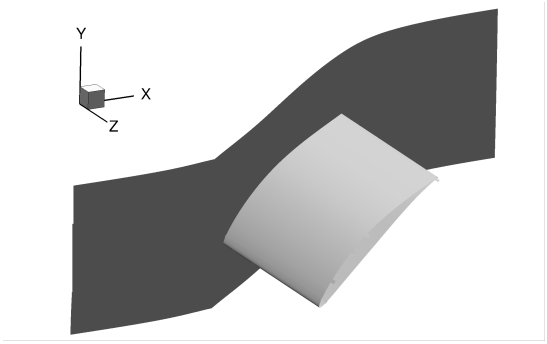


***Figure 1:** Domain of the linear compressor cascade with corner separation*

## WWW

http://www.tfd.uni-hannover.de

## More Information

## DFG Subject Area