Lehrstuhl für Statik und Dynamik
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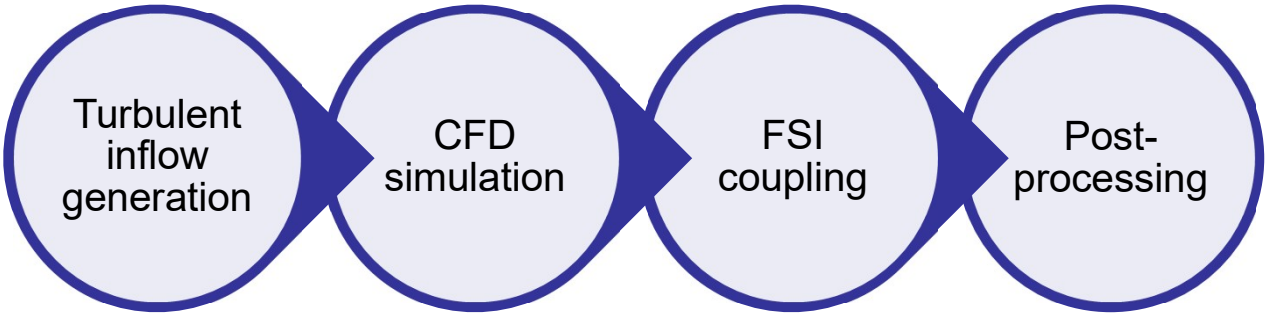
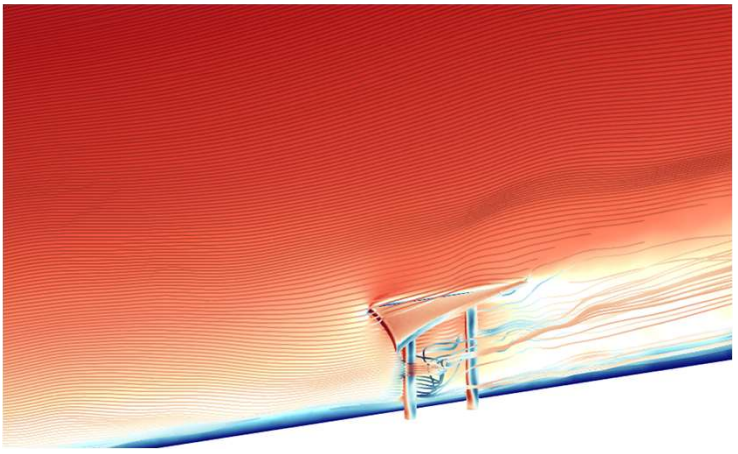
Master's Thesis:

Generation and Validation of Turbulent Inflow for Fluid–Structure Interaction Simulations in Numerical Wind Tunnels

The accuracy of Fluid–Structure Interaction (FSI) simulations under wind loading depends on realistic turbulent inflow conditions. This work investigates several open-source inflow generation methods—*WindGen*, *Digital Filter Method*, *Synthetic Eddy Method*, and *Precursor LES*—and their effect on the aeroelastic response of flexible membrane or lightweight structures.



A numerical wind tunnel will be built using Kratos Multiphysics, validated against ABL profiles, and coupled with the Kratos FSI solver. Structural response under varying inflow conditions will be analyzed to assess the influence of turbulence quality on dynamic behavior.



Expected outcome: Evaluation of inflow techniques for FSI, validation in Kratos Multiphysics, and recommendations for future applications.

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