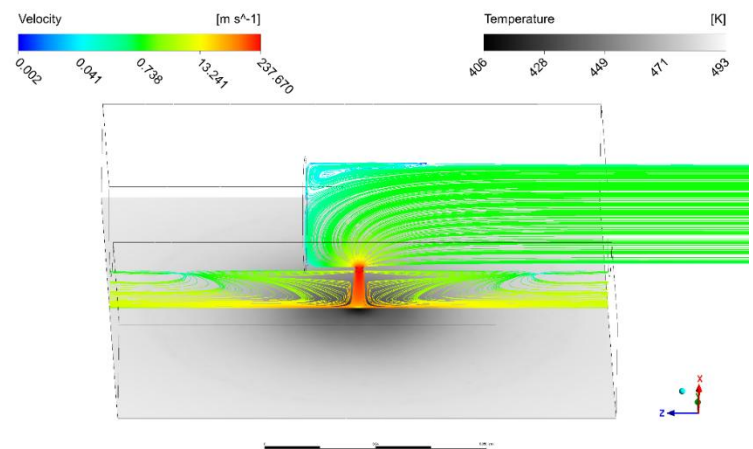


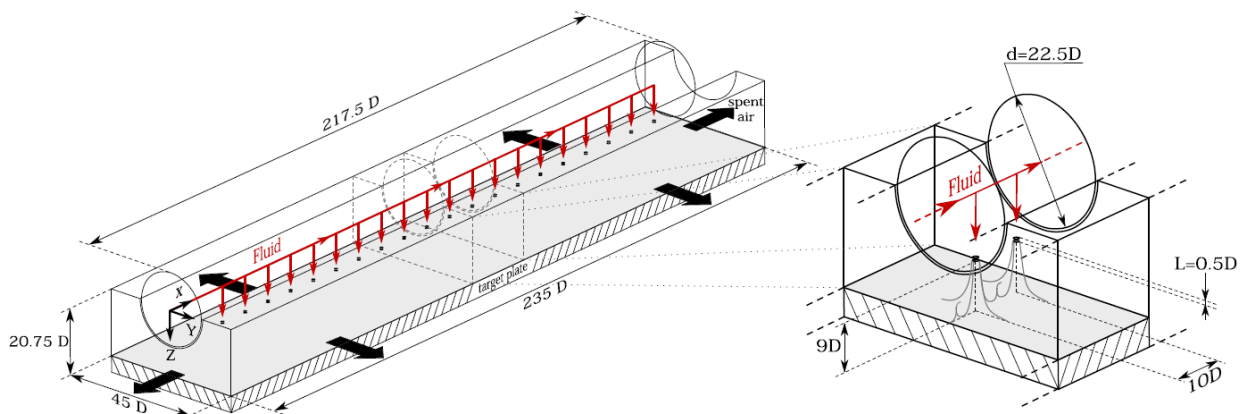
Numerical Characterization and Design of External Impingement Cooling System

External impingement cooling is an established technique which provides very high localized heat transfer capability at the cost of low cooling mass flow. It has become industry-standard in aero engine low-pressure turbines. This study is part of a larger project aiming at assessing the applicability of such concept to compressors, as an active element of a tip-clearance control system.

The work will be carried out numerically and consists mostly of creating a map that correlates key physical parameters, such as jet Reynolds, Mach and Nusselt numbers. Additionally, different geometries will be investigated, with focus on nozzle pitch and diameter. The process chain involves *Ansys* suite tools, such as *Fluent Meshing* and *CFX*. The student will have the opportunity to work on a complete setup, from geometry creation, to meshing, simulating and postprocessing. An excellent opportunity to honing their numerical skills and physical understanding of fluid mechanics and heat transfer.



Source: Internal



Source: Ben Ahmed et al. (2010).

Requirements:

- Previous experience with CFD (pref. *Ansys* suite)
- Good knowledge of Fluid Mechanics and Thermodynamics
- Previous experience with programming
- Independent working style

Type of work: Theoretical/numerical Master/Diploma thesis.

Start: 15.07.2025 or later

If you are interested in working on this topic, please send an email to the address listed below with your full application. Please provide a CV with relevant experiences and your current transcript of records. Any other relevant documents (certificates, recommendation letters, etc.) are welcome.