

Rotation Rig Darmstadt

Objective:

impact of system rotation on fluid flows
as well as heat and mass transfer

Test object:

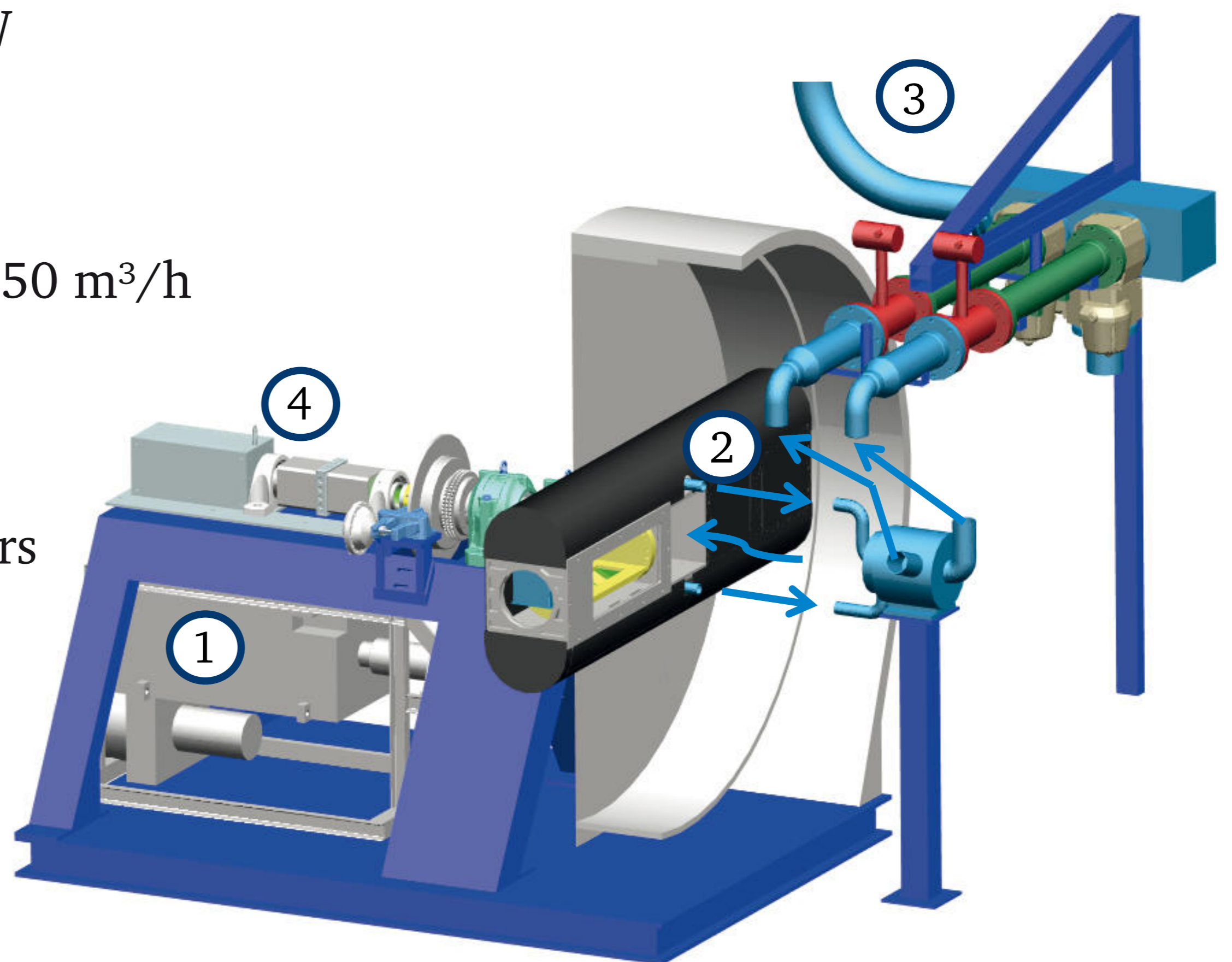
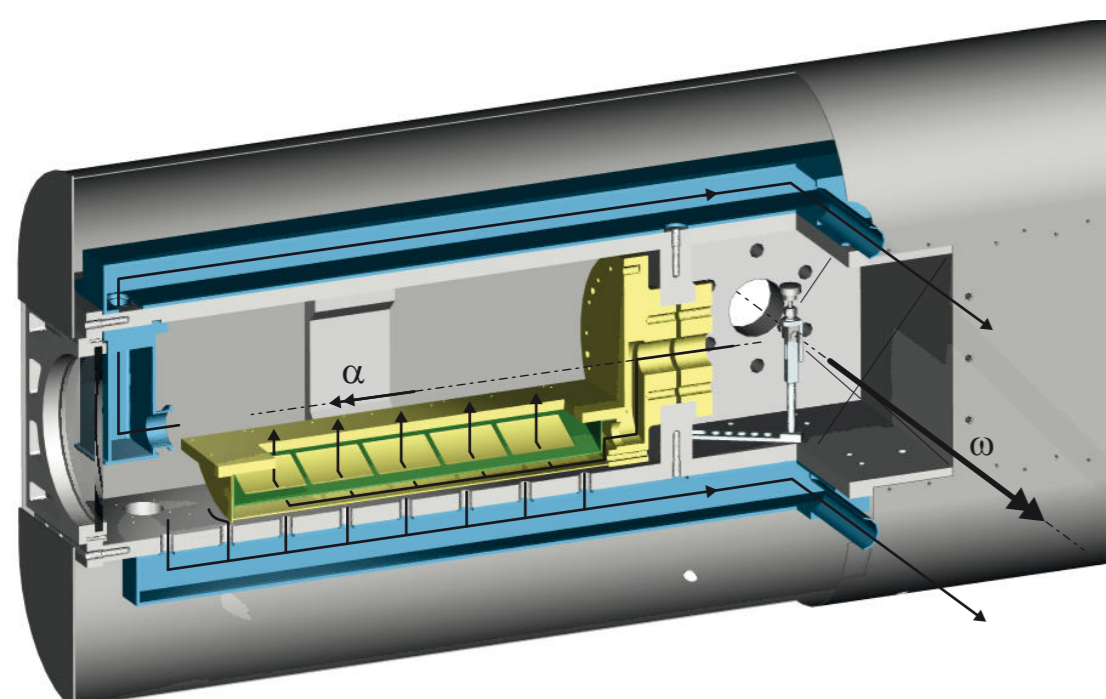
cooling ducts of turbine blades
(generic approximated geometries)

Rotation Rig

rotor power unit: direct current motor 111 kW
max. 1500 rpm (balanced)

air supply: suction operation 22,6 kW
max. 0,45 bar respectively 550 m³/h
dual flow fluid transmitter

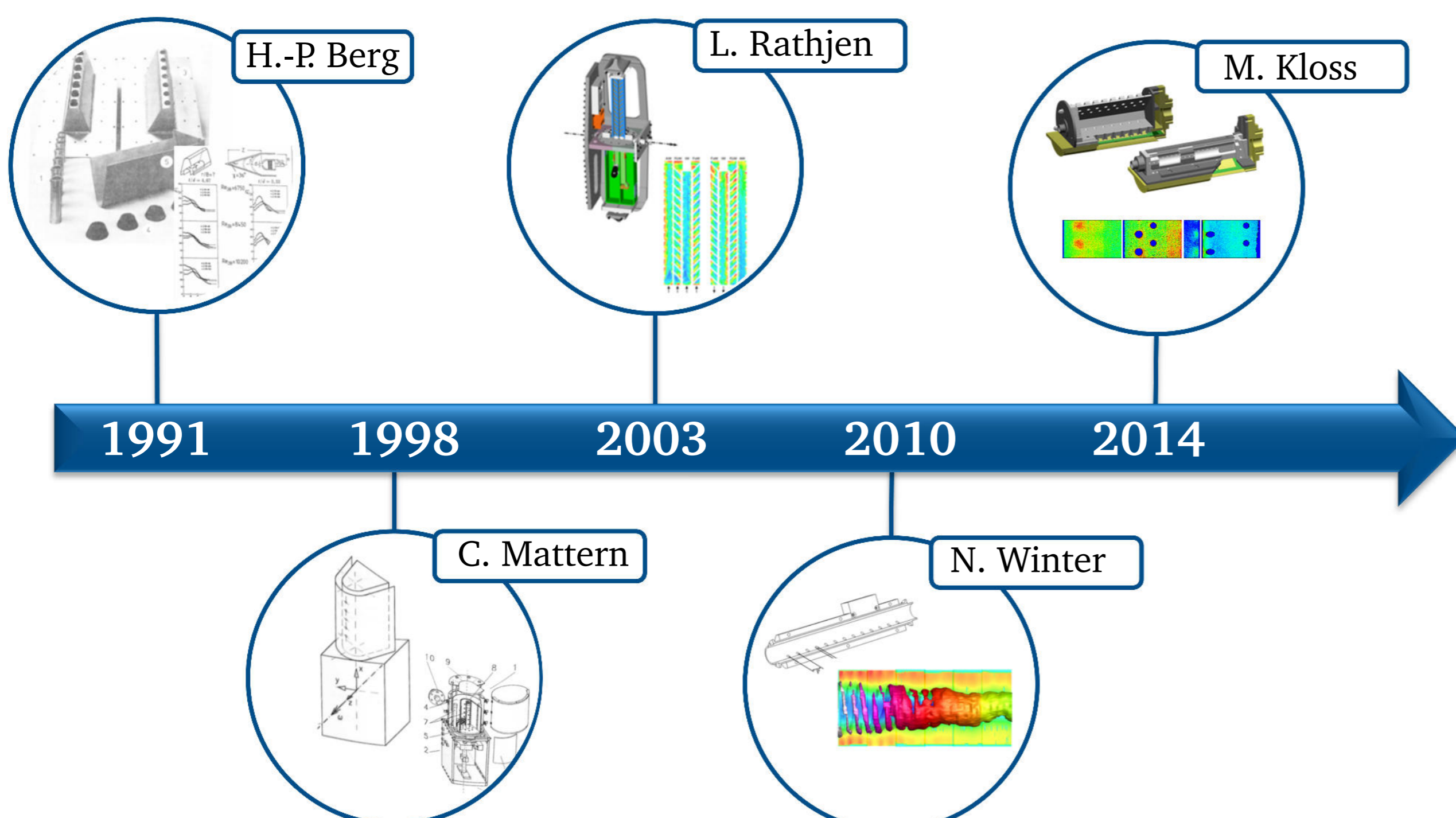
sensors: 32 thermistoren
32 piezo pressure transducers
2 swirl flowmeters



① drive motor ② rotor ③ fluid supply ④ telemetry

Realized Measurements

techniques: Naphthalene Sublimation Technique (NST)
Particle Image Velocimetry (PIV)



Outlook

Development and application of
optical measurement techniques
for identification of heat transfer
in rotating systems.

potential techniques

- Thermochromic Liquid Crystals
- Laser-Induced Fluorescence
- Laser-Induced Phosphor Thermometry