

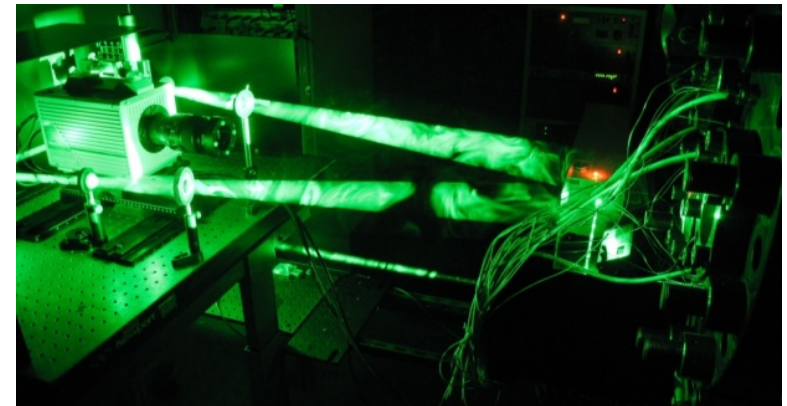
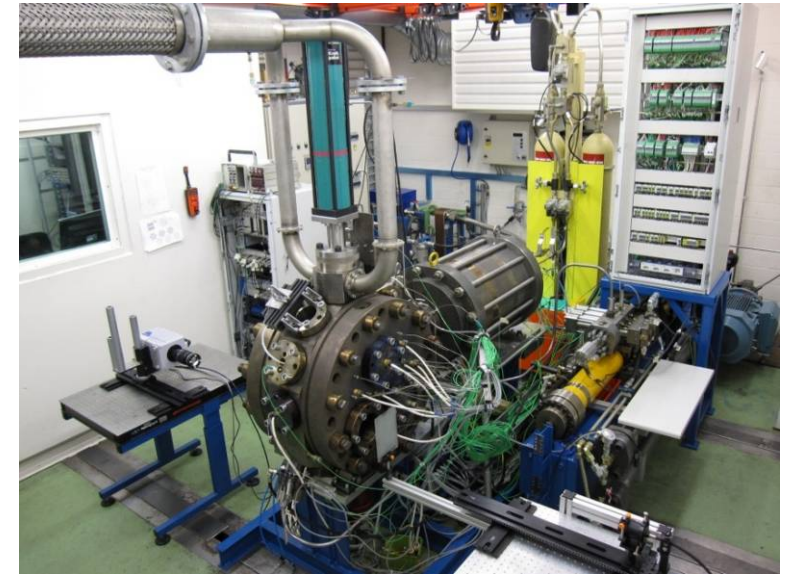
## Task 2.1: Combustion process modeling and development

### Objectives:

To investigate with CFD and propose combustion concepts that offer improved trade-offs between fuel consumption and emissions, compared to today's marine engines

To acquire relevant and valid reference data to use as model input as well as model validation

To develop and/or adapt CFD tools and simulation methods used, to the extent required to make them useful for simulating marine engine combustion processes



The spray combustion chamber (SCC) advanced testing facility

Partners:



HERCULES-B

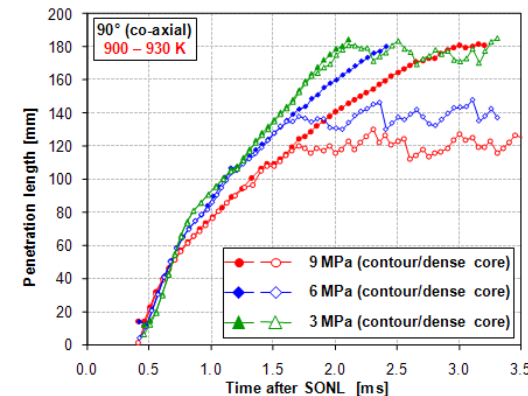
## Task 2.1: Combustion process modeling and development

### Experimental highlights:

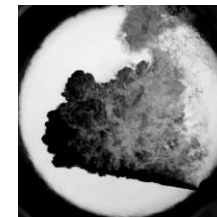
- Considerable amounts of quantitative reference and validation data are now available from the SCC.
- The SCC can now operate also on HFO.
- A specially devised illumination setup based on Mie scattering has enabled testing of real engine nozzles.
- A PDA setup has been prepared for application at the SCC, and the feasibility of applying exciplex LIF has been investigated.

### Simulation highlights:

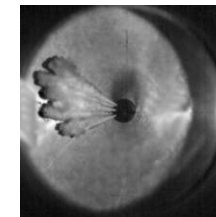
- SCC test data have been used to improve CFD submodels.
- Advanced methodologies for CFD-based combustion system optimisation have been developed.
- The developed/improved simulation methodologies and models are now being systematically and regularly applied to optimise existing as well as new combustion systems.



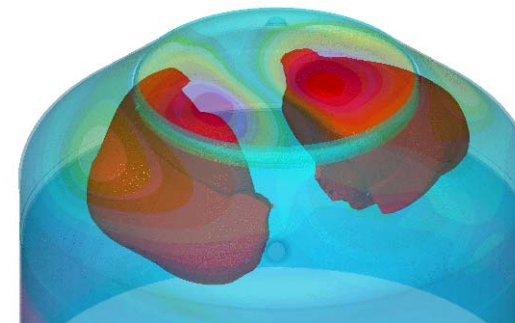
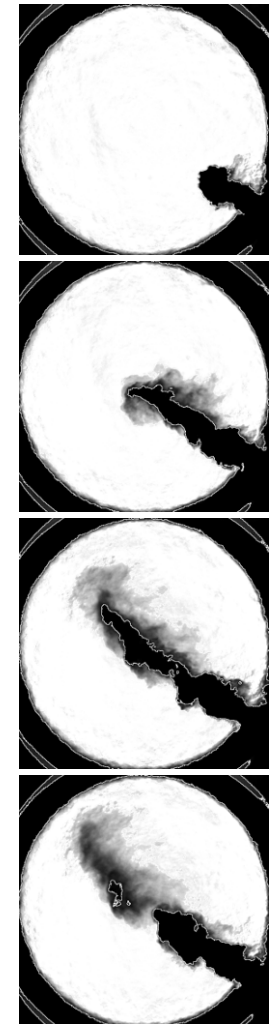
Penetration measurements for the outer spray contour and the dense spray core.



HFO combustion



Mie scattering



Simulation: combustion and wall heat transfer.

Partners:

