



Politechnika Wroclawska

Wroclaw University of Technology

Department of Numerical Modelling
of Flows

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Research area

- numerical modelling of 2D and 3D vortex structures by „vortex in cell” (ViC) method

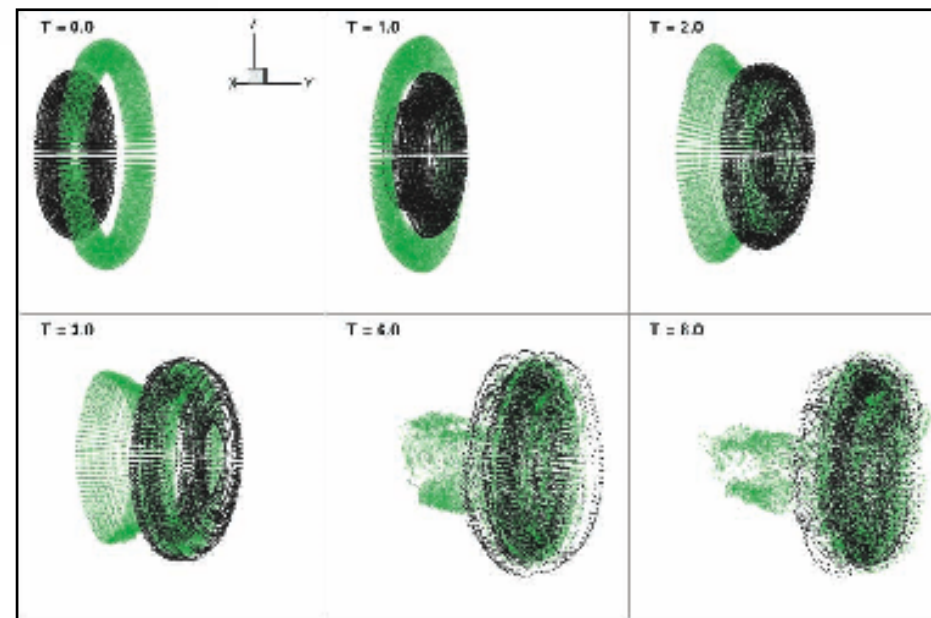
$$\alpha_{p(i)} = \int_{V_p} \omega_i(x_1, x_2, x_3) dx \approx h^3 \omega_i(x_p) \quad \text{- discretization of vorticity field}$$

$$x_p \in V_p, \quad |V_p| = h^3$$

Formulation of the problem in terms of vorticity and vector potential fields

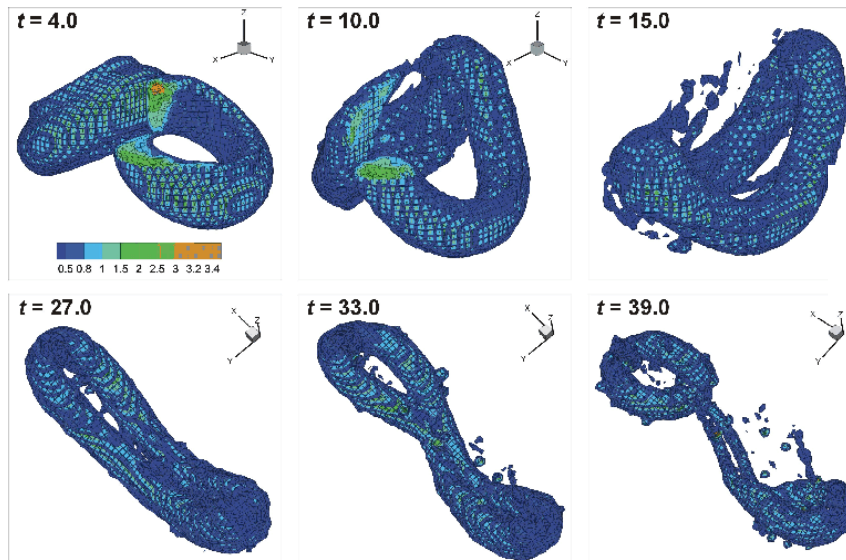
$$\Delta A_i = -\omega_i$$

$$\frac{d\omega}{dt} = (\omega \cdot \nabla) \mathbf{u} + \nu \Delta \omega$$



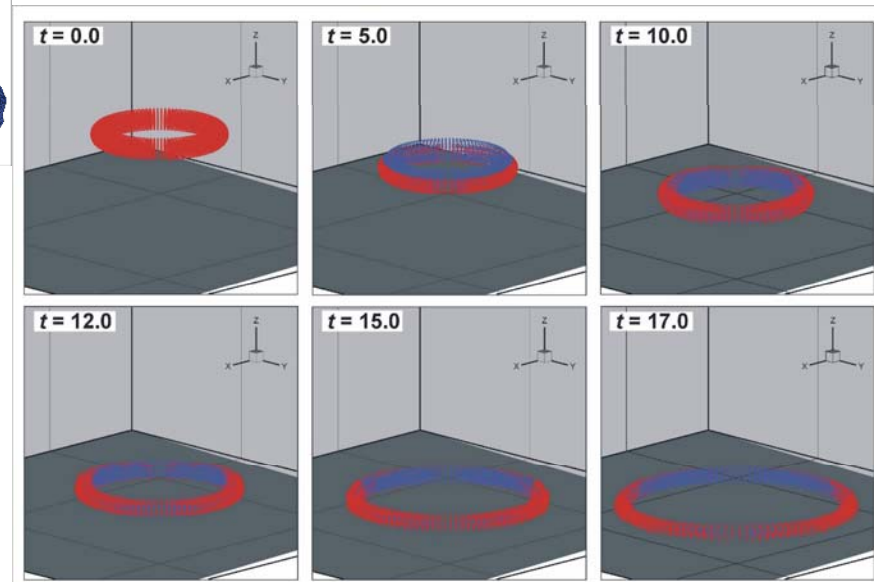


Research area



-analysis of vortex structures interactions in 2D and 3D inviscid and viscous flows

-investigation of interaction of vortex ring with rigid wall

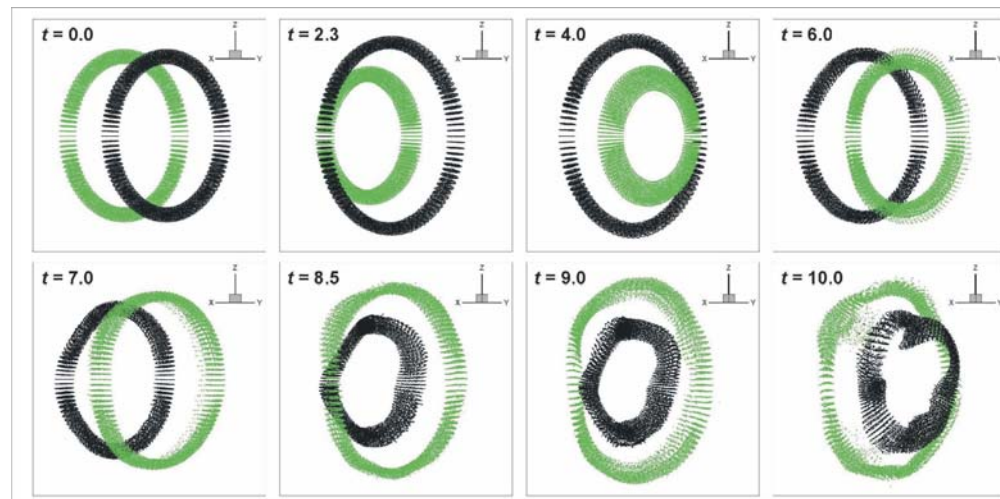




Possible areas of further investigations

- evolution of turbulent spots in boundary layer,
- investigation of interaction of vortex rings with a wall and study of creation and evolution of secondary vortex structures,
- investigation of evolution of a set of vortex structures in 3D flow,

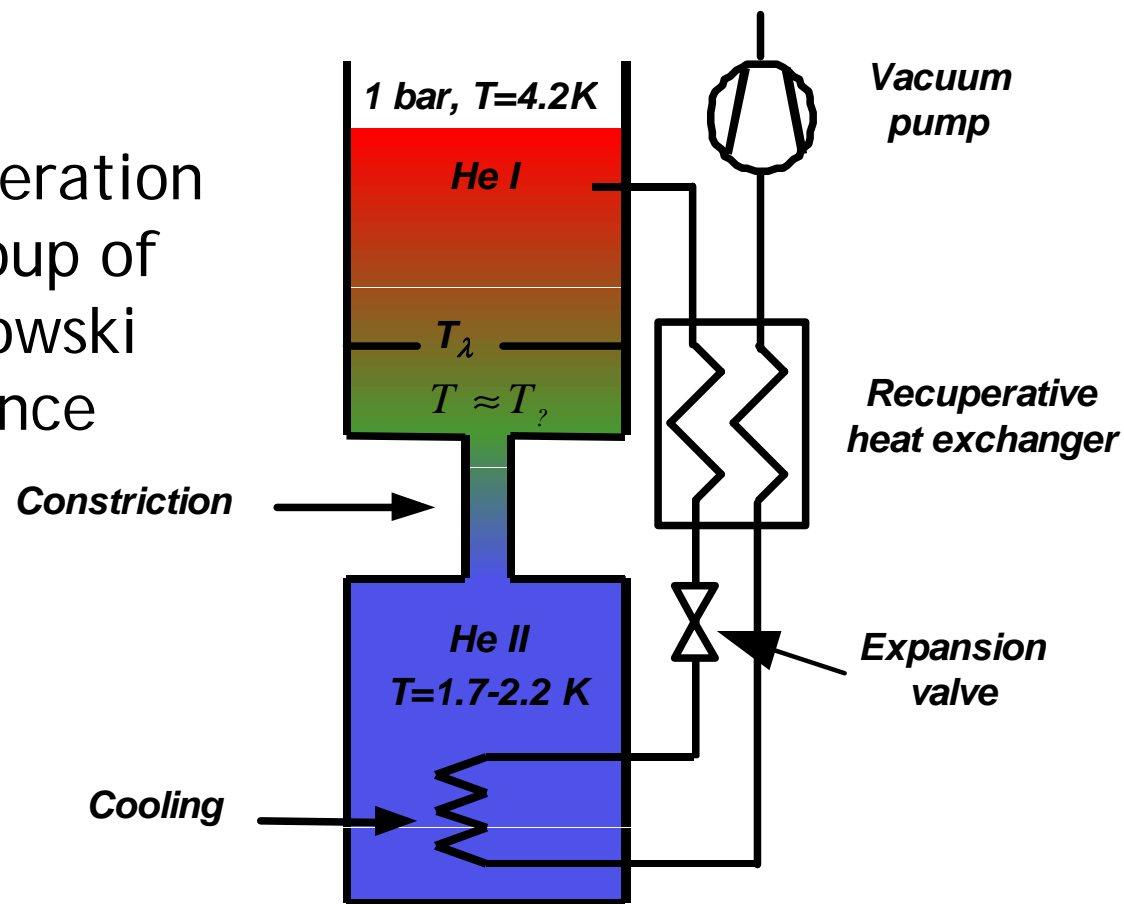
-Implementation to the algorithm
a model of turbulence





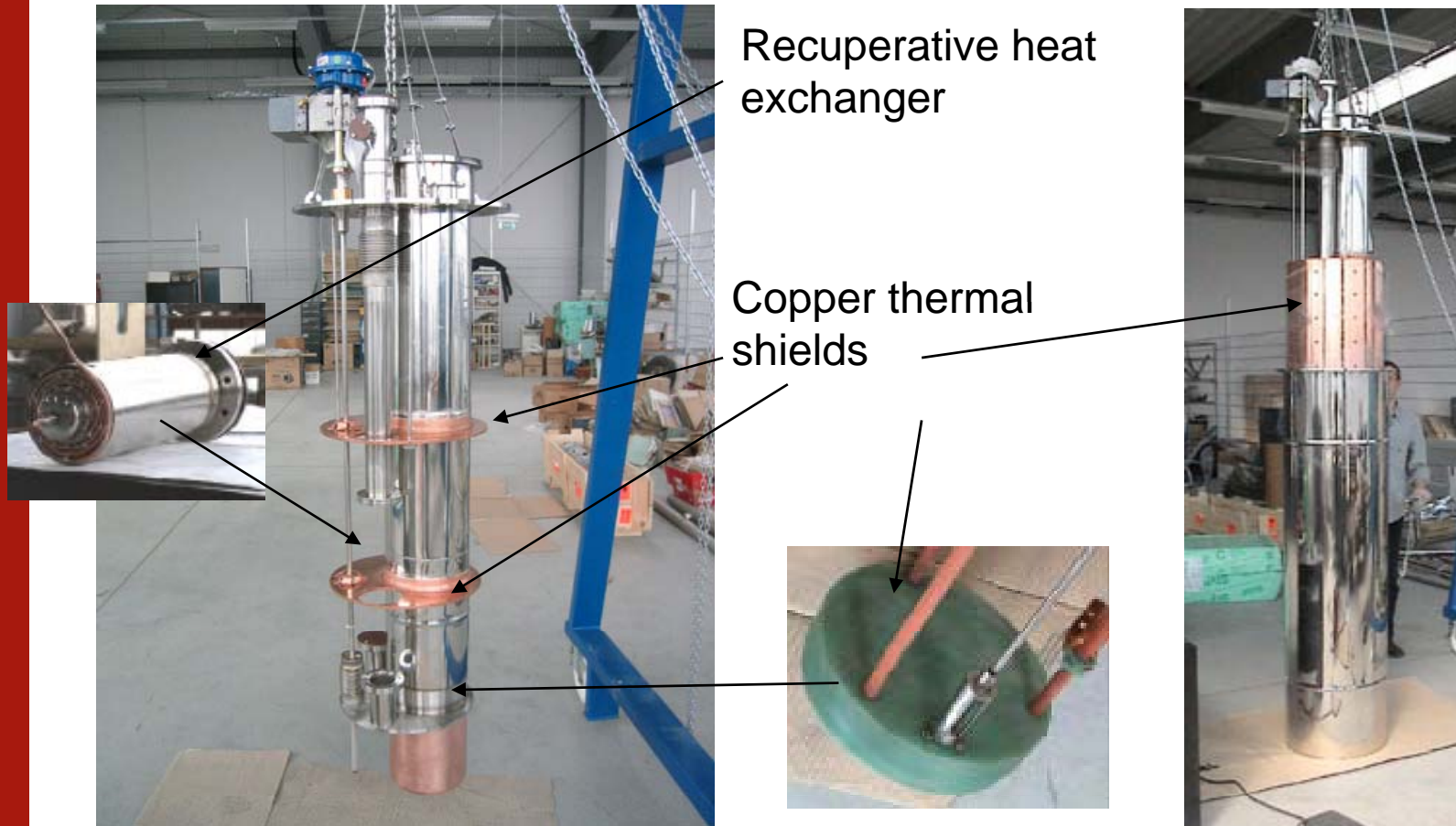
Experience of Wroclaw University of Technology in construction of He II cryostats

Possibility of cooperation with cryogenic group of prof. Maciej Chorowski which has experience in construction of He II cryostats





The NED cryostat, construction phase at WUT





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