



ENERGY



CAME-GT

THEMATIC NETWORK FOR CLEANER & MORE EFFICIENT GAS TURBINES

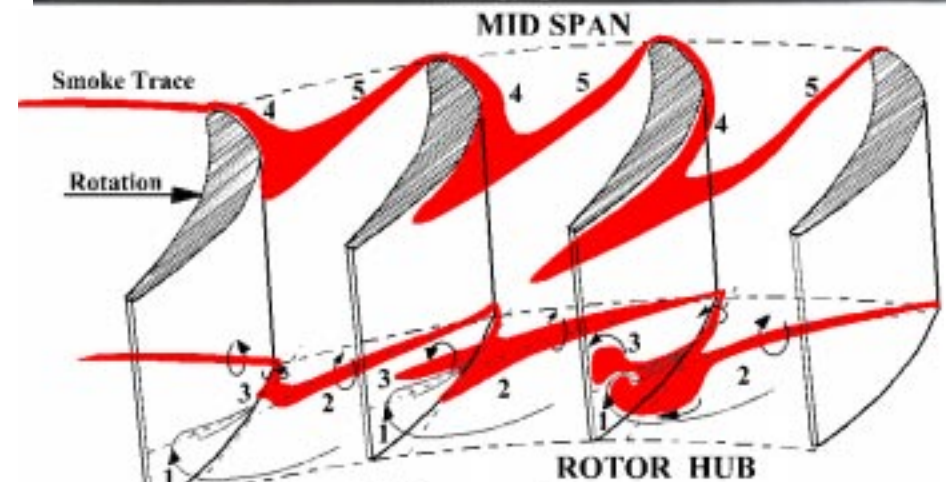
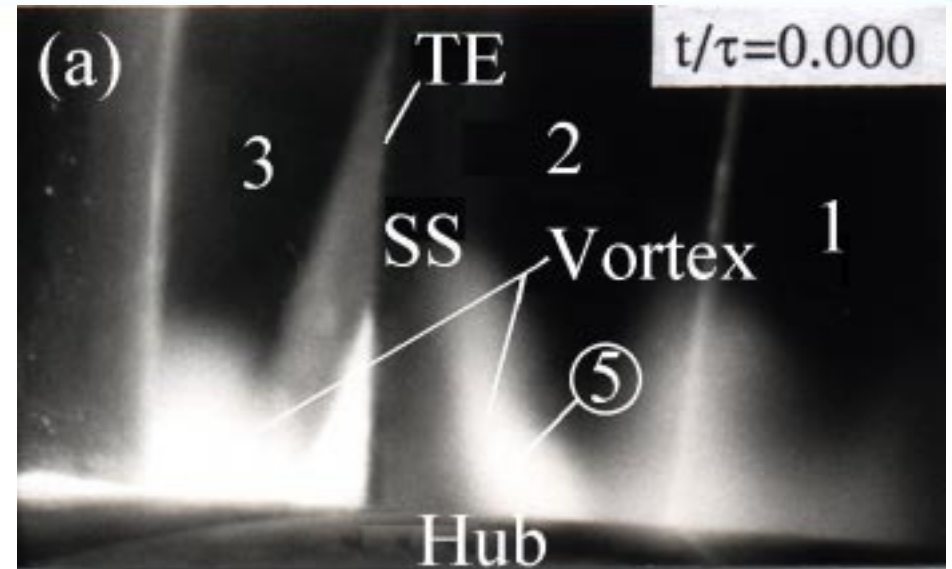
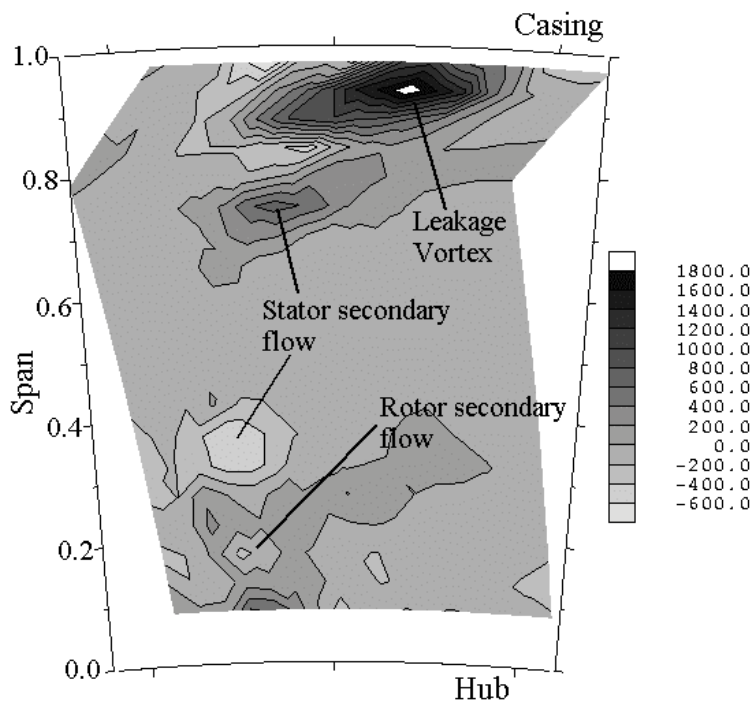
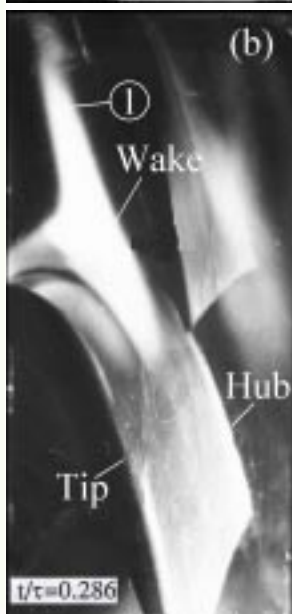
Unsteady Flows in Axial Gas Turbines

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Brussels, 16th February 2001

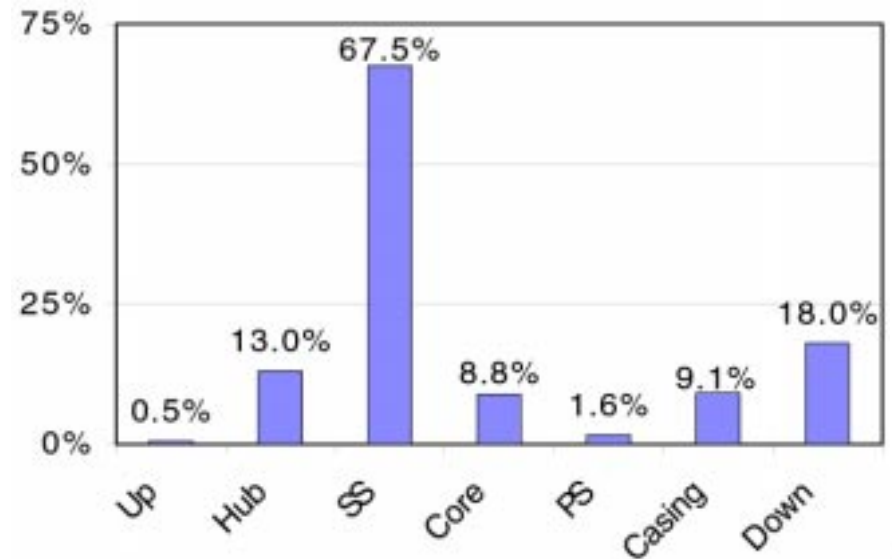
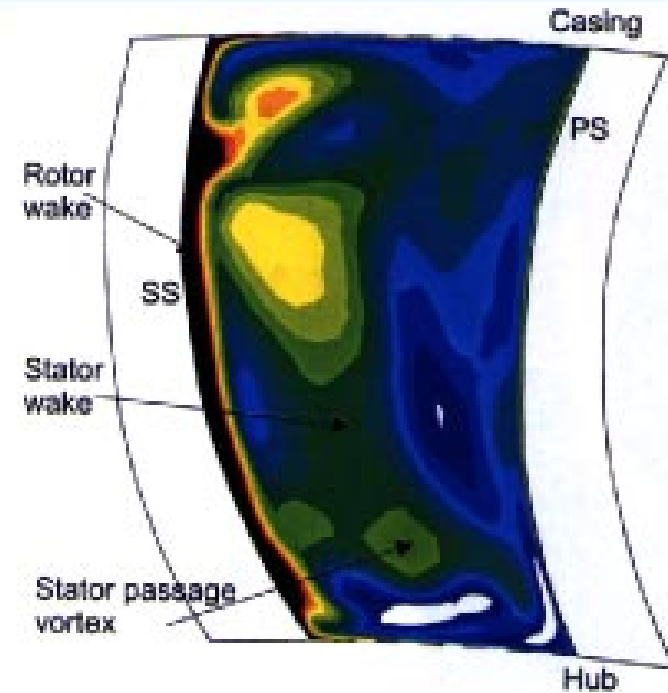
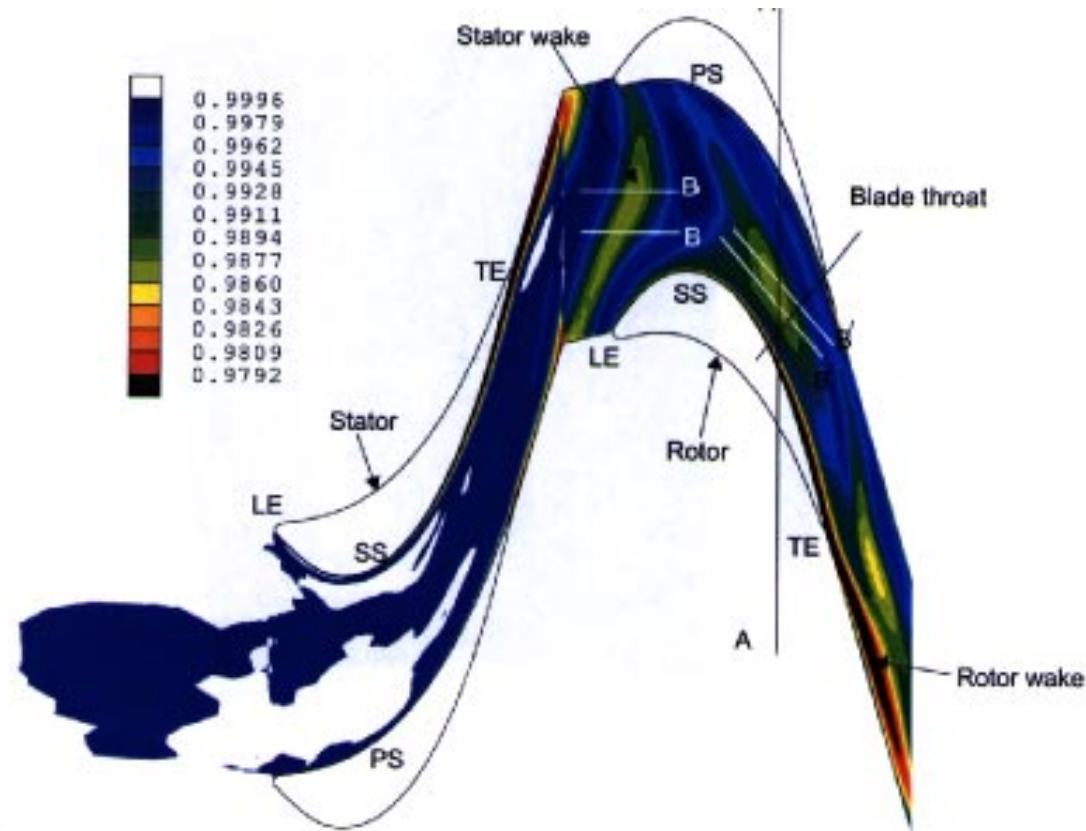


Unsteady Data and BladeVortex Model



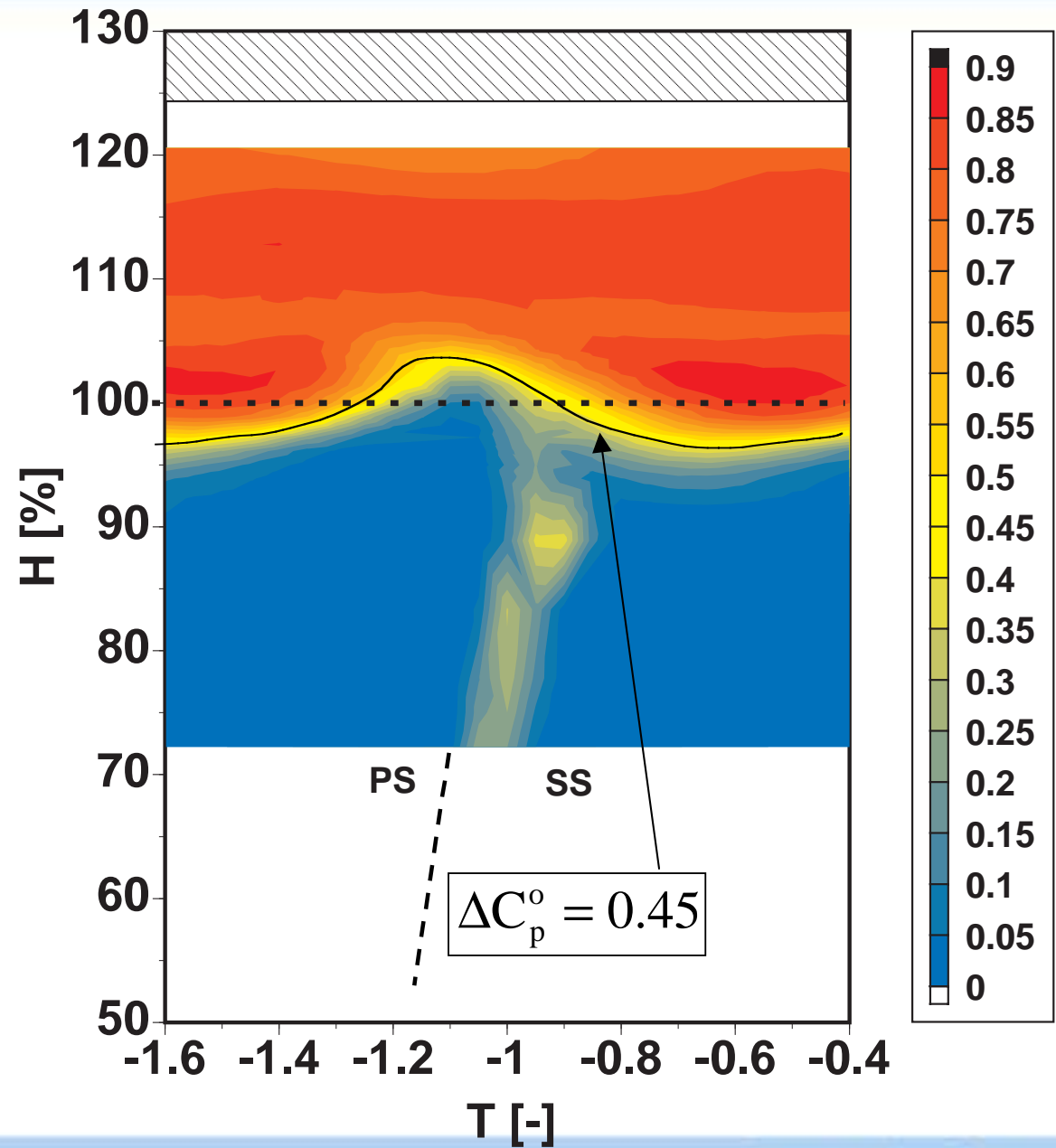
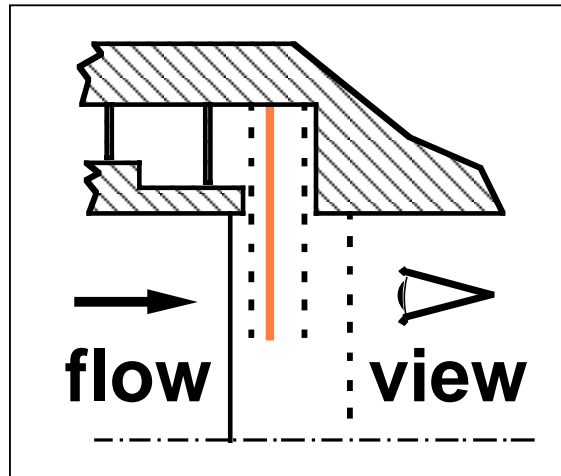
- 1 - Rotor Hub Passage Vortex
- 2 - Pressure Side Leg of Stator Hub Passage Vortex
- 3 - Suction Side Leg of Stator Hub Passage Vortex
- 4 - Suction Side Leg of Stator Wake
- 5 - Pressure Side Leg of Stator Wake

Unsteady Numerical Simulations Loss Generation Rate Budget



Total Pressure Loss (ΔC_p°)

$$\Delta C_p^\circ = \frac{p_{in}^\circ - p^\circ}{p_{in}^\circ - p_{ex}}$$



Concluding Remarks

- Lessons from Previous Research
 - ◆ Steady and Unsteady Measurements and CFD
 - ◆ Evaluation of Loss Production
- The way forward
 - ◆ Effective Application of Tools and Methods to increasingly complex geometries and Problems
 - ↳ Tip Leakage and Over Shroud Leakage
 - ↳ Endwall Treatment
 - ↳ Cooling
 - ◆ Robust Endwall Flow Management