

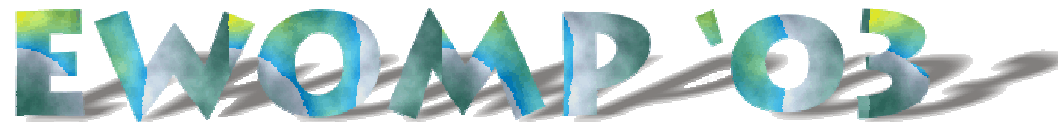
ThermoFlow60

Within the Project

C o F F E A

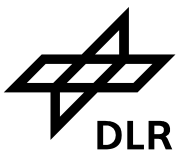
Compressible Flow Finite Element Analysis

presented at



EWOMP '03

OpenMP-Lab
Aachen, Sept. 24.-26.



Cooperation on Parallelisation using OpenMP

**German Aerospace Center (DLR)
Jet Propulsion Lab. (RWTH)**

**Ulrich Wepler
Thomas Haarmann
Wolfgang Koschel**

**Center for Computation and
Communication (RWTH)**

**Dieter an Mey
Alexander Spiegel**

CoFFEA

Compressible Flow Finite Element Analysis

- ③ **Simulation for Research in Aerospace Propulsion**
- ③ **Solving the Navier-Stokes Equations using a Finite-Element-Method**
- ③ **Home-Grown Code**
 - 15 Years of Development
 - developed at the Jet Propulsion Lab., RWTH
 - continued at the Inst. for Space Propulsion, DLR



Heat Flow Simulation using ThermoFlow60

- ▶ 2D axissymmetric calculation because of rotational symmetrie
- ▶ 29000 lines of Fortran
- ▶ ~ 200 OpenMP directives
- ▶ 69 parallel loops
- ▶ 1 main parallel region (orphaning)
- ▶ 200,000 cells
- ▶ 230 MB memory footprint
- ▶ 2 weeks serial runtime

