CAMPAS

Calculs Massivement Parallèles multi-cycle / multi-cylindre de moteurs à piston par une approche SGE

✔ **COMPLETED PROJECT**

The objective of the CaMPaS project is to demonstrate the feasibility of a multi-cycle Large-Eddy Simulation (LES) of the reactive flow inside a complete multicylinder internal combustion engine using the AVBP CFD code on a massively parallel supercomputer.

PROGRESS BEYOND THE STATE OF THE ART

The LES code AVBP was improved to deal with all the specific and until then unaddressed problematics required to set up and carry out the world's first multicycle LES of a fired multicyclinder engine. This opens unprecedented perspectives for the study and understanding of combustion instabilities in full internal combustion engines, which are sources for increased fuel consumption and pollutant emissions.

4th Cycle, combustion in Cyl. 2
Velocity [m/s]
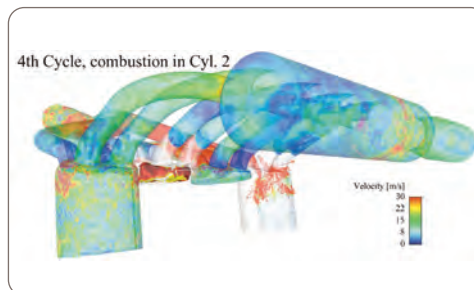
MAJOR PROJECT OUTCOMES

▶ Products:
The AVBP code is now capable of:
• dealing with an arbitrary number of moving patches using the Conditioned Temporal Interpolation algorithm
• parallel interpolation of solutions between grids
• parallel partitioning of grids using the ParMETIS package; postprocessing multicyclinder multicycle engine simulations
• automatically adjustment of combustion model parameters using a coupled filtering module based on the Germano identity

▶ Services:
Adressing multicylinder and multicycle issues such as cylinder to cylinder and cycle to cycle variabilities which have a negative impact on on engines effeciency will be possible.

CONTACT

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PARTNERS

Large companies:
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SMEs:
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Research institutes, universities:
CERFACS, EM2C (CNRS), IFP

PROJECT DATA

Coordinator:
IFP

Call:
ANR

Start date:
January 2007

Duration:
42 months

Global budget (M€):
0.8

Funding (M€):
0.4