Verification type	Manufactured Solutions
Database reference	MAN-4
Topic / Application	Manufactured Solutions
Physics	Navier Stokes Euler Equations
Summary	A phD paper which comprehensively describes the verification process on a NS 3-D code, as well as its boundary conditions
Description	A detailed code verification study of an unstructured finite volume Computational Fluid Dynamics (CFD) code is performed. The Method of Manufactured Solutions is used to generate exact solutions for the Euler and Navier-Stokes equations to verify the correctness of the code through order of accuracy testing. The verification testing is performed on different mesh types which include triangular and quadrilateral elements in 2D and tetrahedral, prismatic, and hexahedral elements in 3D. The requirements of systematic mesh refinement are discussed, particularly in regards to unstructured meshes. Different code options verified include the baseline steady state governing equations, transport models, turbulence models, boundary conditions and unsteady flows. Coding mistakes, algorithm inconsistencies, and mesh quality sensitivities uncovered during the code verification are presented.
Case Title	Code Verification and Numerical Accuracy Assessment for Finite Volume CFD Codes
Authors	Subrahmanya P. Veluri
Year	2010
Online reference	http://www.tetraresearch.com/CHEM%20Papers/Veluri_SP_D_2010.pdf
Case image	
Governing equations	
Results	

The SUSANA project is co-funded by the European Commission within the 7th Framework Program

Grant agreement no.: FCH-JU-325386