Verification type	Methodology
Database reference	MET-1
Topic / Application	Methodology Analytical Solution
Physics	1-D wave equation Boundary layer flows RANS
Summary	A very useful tutorial paper explaining the verification process applied to CFD codes, including analytical solutions, calculation of error norms.
Description	This summary paper on verification procedures is useful for introducing many basic verification concepts to practitioners. An example of practical verification is given on a RANS CFD code applied to drag on an aerodynamic object. The paper also provides the analytical solution to the 1-D wave equation and uses this for verification purposes. The authors note that for practical applications many issues, solutions may be far from the asymptotic range (and so do not admit themselves to formal verification procedures). Also, they note that analysis and interpretation of results is important in assessing variability for order of accuracy, levels of verification, and strategies for reducing numerical and modelling errors and uncertainties
Case Title	Verification and Validation of CFD Simulations
Authors	F. Stern, R. Wilson, H. Coleman, and E. Paterson
Year	2001
Online reference	2001 Fluids Engineering Division Summer Meeting May 29 -June 1, 2001, New Orleans, Louisiana

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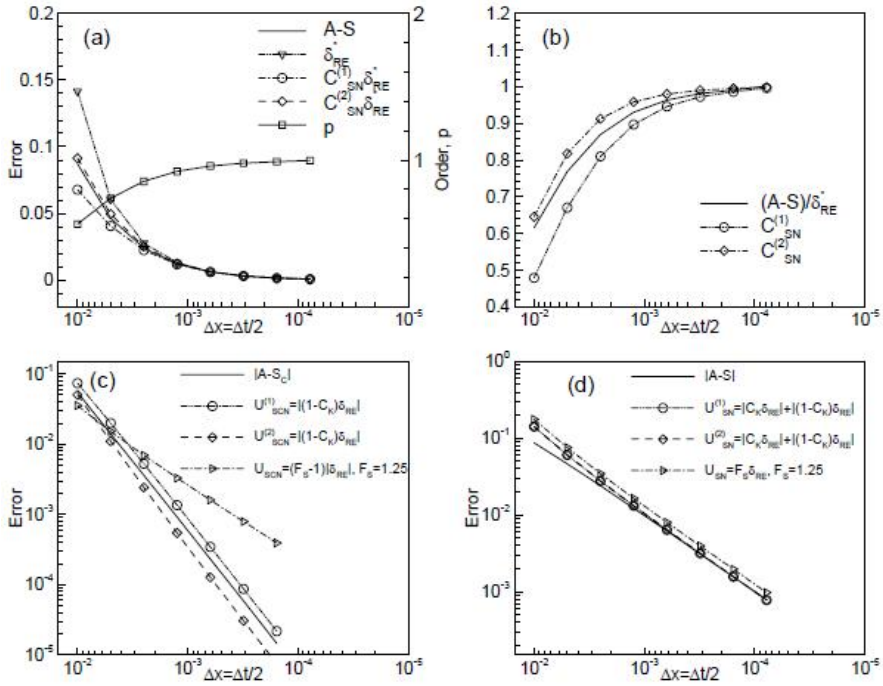
Case image	 Verification results 1storder solution 1D wave equation
Governing equations	Paper provides reference for wave equation analytical solution
Results	

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