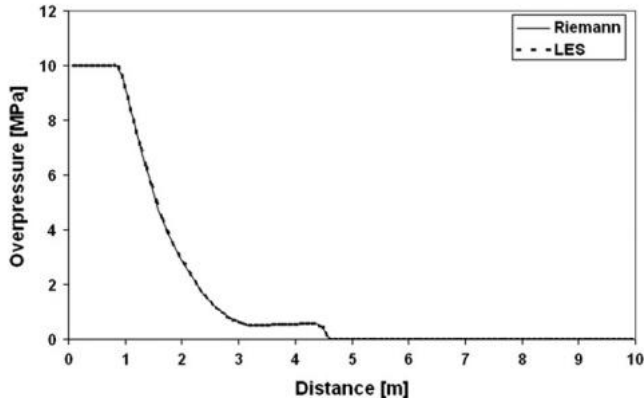


Verification type	Analytical Solutions
Database reference	ANA-2
Topic / Application	Hydrogen LES
Physics	Detonation
Summary	Authors use LES to simulate hydrogen-air detonation. The solution is verified against a simplified /analytical model (ZND).
Description	<p>A large eddy simulation (LES) model of hydrogen-air detonation at very large scales, is presented. The LES model is verified against theoretical solution by the Zel'dovich-von Neumann-Doring (ZND) theory for a case of planar 29.05% hydrogen-air detonation in elongated 3 x 3 x 100 m calculation domain.</p> <p>A Riemann problem (RP) is also simulated as it gives an exact solution to non-linear equations like the Euler equations.</p> <p>The numerical simulation reproduced theoretical values of von Neumann spike, Chapman-Jouguet pressure, Taylor wave and detonation propagation velocity.</p>
Case Title	LES Model of Large Scale hydrogen-air planar detonations; verification by the ZND theory
Authors	Zibrowski, M. Marakov, D. Volkov, M.
Year	2008
Online reference	International Journal of Hydrogen Energy 33 (2008) 4884-4892
Case image	 <p>Comparison between analytical solution and numerical simulation of the Riemann problem</p>



SUpport to SAfety ANalysis of Hydrogen and Fuel Cell Technologies

Governing equations	
Results	

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