

SUpport to SAfety ANalysis of Hydrogen and Fuel Cell Technologies

Verification type	Methodology
Database reference	MET-2
Topic / Application	Methodology Numerical Error Sources Aerodynamics
Physics	Supersonic / Compressible flows
Summary	Paper compares the numerical errors from a RANS and a simpler multi-block inviscid “zonal” model of compressible flows.
Description	The paper compares the accuracy of simulations of supersonic flows from a RANS and from a simpler parameterised model. Grid sensitivity studies are also undertaken. This paper is included in the methodology part of the database because of the focus on shock waves and compressible flows (relevant for hydrogen detonation) but also the practical procedures used in making the comparisons
Case Title	Accuracy Issues in the Prediction of Supersonic Inlet Flows
Authors	G. C. PAYNTER and E. TJONNELAND
Year	1992
Online reference	ASME Paper 92-GT-400
Case image	
Governing equations	
Results	The conclusion is that both approaches demonstrate similar levels of accuracy. It should be noted however that at the date of the paper the computational resources were limited and that as of 2015 given advances in computing resources a similar conclusion may not apply.