cases	doc_1	doc_2	decision	id

doc_1

authors	
title	Efficient conservative ADER schemes based on WENO reconstruction and space-time predictor in primitive variables
publication_date	2016-01-13 00:00:00
source	SupportedSources.CORE
journal	None
volume	
doi	10.1186/s40668-015-0014-x
urls	• https://core.ac.uk/download/pdf/81094606.pdf
id	id-8514796445621322044
abstract	None
versions	

doc_2

authors	• Olindo Zanotti • Michael Dumbser
title	Efficient conservative ADER schemes based on WENO reconstruction and space-time predictor in primitive variables
publication_date	2015-11-15 16:40:23+00:00
source	SupportedSources.ARXIV
journal	None
volume	
doi	
urls	• http://arxiv.org/pdf/1511.04728v2 • http://arxiv.org/abs/1511.04728v2 • http://arxiv.org/pdf/1511.04728v2
id	id-9064900862523186648
abstract	We present a new version of conservative ADER-WENO finite volume schemes, in which both the high order spatial reconstruction as well as the time evolution of the reconstruction polynomials in the local space-time predictor stage are performed in primitive variables, rather than in conserved ones. Since the underlying finite volume scheme is still written in terms of cell averages of the conserved quantities, our new approach performs the spatial WENO reconstruction twice: the first WENO reconstruction is carried out on the known cell averages of the conservative variables. The WENO polynomials are then used at the cell centers to compute point values of the conserved variables, which are converted into point values of the primitive variables. A second WENO reconstruction is performed on the point values of the primitive variables to obtain piecewise high order reconstruction polynomials of the primitive variables. The reconstruction polynomials are subsequently evolved in time with a novel space-time finite element predictor that is directly applied to the governing PDE written in primitive form. We have verified the validity of the new approach over the classical Euler equations of gas dynamics, the special relativistic hydrodynamics (RHD) and ideal magnetohydrodynamics (RMHD) equations, as well as the Baer-Nunziato model for compressible two-phase flows. In all cases we have noticed that the new ADER schemes provide less oscillatory solutions when compared to ADER finite volume schemes based on the reconstruction in conserved variables, especially for the RMHD and the Baer-Nunziato equations. For the RHD and RMHD equations, the accuracy is improved and the CPU time is reduced by about 25%. We recommend to use this version of ADER as the standard one in the relativistic framework. The new approach can be extended to ADER-DG schemes on space-time adaptive grids.
versions	

decision	id
NOT DUPLICATES	1048