Accepted Manuscript

A New Troubled-Cell Indicator for Discontinuous Galerkin Methods for Hyperbolic Conservation Laws

Guosheng Fu, Chi-Wang Shu

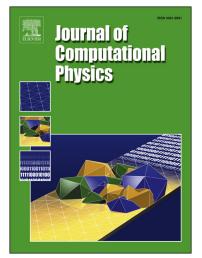
 PII:
 S0021-9991(17)30500-4

 DOI:
 http://dx.doi.org/10.1016/j.jcp.2017.06.046

 Reference:
 YJCPH 7445

To appear in: Journal of Computational Physics

Received date:29 January 2017Revised date:4 June 2017Accepted date:29 June 2017



Please cite this article in press as: G. Fu, C.-W. Shu, A New Troubled-Cell Indicator for Discontinuous Galerkin Methods for Hyperbolic Conservation Laws, *J. Comput. Phys.* (2017), http://dx.doi.org/10.1016/j.jcp.2017.06.046

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

ACCEPTED MANUSCRIPT

A New Troubled-Cell Indicator for Discontinuous Galerkin Methods for Hyperbolic Conservation Laws

Guosheng Fu^1 and Chi-Wang Shu^2

ABSTRACT

We introduce a new troubled-cell indicator for the discontinuous Galerkin (DG) methods for solving hyperbolic conservation laws. This indicator can be defined on unstructured meshes for high order DG methods and depends only on data from the target cell and its immediate neighbors. It is able to identify shocks without PDE sensitive parameters to tune. Extensive one- and two-dimensional simulations on the hyperbolic systems of Euler equations indicate the good performance of this new troubled-cell indicator coupled with a simple minmod-type TVD limiter for the Runge-Kutta DG (RKDG) methods.

Key Words: discontinuous Galerkin method, limiters, troubled-cell indicator, high order accuracy

AMS(MOS) subject classification: 65M60, 65M99, 35L65, 35L67

¹Division of Applied Mathematics, Brown University, Providence, RI 02912, USA. E-mail: guosheng_fu@brown.edu.

²Division of Applied Mathematics, Brown University, Providence, RI 02912, USA. E-mail: shu@dam.brown.edu. Research supported by ARO grant W911NF-15-1-0226 and NSF grant DMS-1418750.

Download English Version:

https://daneshyari.com/en/article/4967145

Download Persian Version:

https://daneshyari.com/article/4967145

Daneshyari.com