LOCAL SMOOTHNESS INDICATORS

HUGO CARRILLO, EMANUELE MACCA, AND GIOVANNI RUSSO

ABSTRACT. We will present a new approach to compute local smoothness indicators to catch the smoothness of a region. Fixed a stencil S using $2p$ points for each $p = 1, \ldots, P$ and employing finite difference discretization to approximate the $l-$th derivatives for each $l = 0, \ldots, 2p - 2$, we are able to determinate automatically the local smoothness of the region.

As an application, we use the technique in conjunction with the ACAT-LW methods presented by H. Carrillo and C. Pares for quasilinear hyperbolic conservation laws in one space dimension [1]. Several numerical tests are presented that emphasize the effectiveness of the technique.

Keywords: Smoothness indicators; finite difference; conservation laws.

REFERENCES

[1] H. Carrillo and C. Pares, *Lax-Wendroff type reconstruction-free high-order shock-capturing finite difference methods for hyperbolic conservation laws*, reviewing (2018).

DEPARTMENT OF APPLIED MATHEMATICS, UNIVERSITY OF MALAGA, MALAGA, SPAIN
E-mail address: hcarrillo@uma.es

DEPARTMENT OF MATHEMATICS AND INFORMATICS, UNIVERSITY OF CATANIA, 95125 CATANIA, ITALY
E-mail address: emanuele.macca92@gmail.com

DEPARTMENT OF MATHEMATICS AND INFORMATICS, UNIVERSITY OF CATANIA, 95125 CATANIA, ITALY
E-mail address: russo@dmi.unict.it