

# Polynomial WENO approximation with applications

(Poster)

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(joint work with Nelida Črnjarić-Žic)

Weighted essentially non-oscillatory (WENO) procedure is used for a non-oscillatory approximation of a function. The typical WENO procedure constructs a rational approximation of a function  $v(x)$  based on known cell averages of function  $v(x)$ . This approximation is essentially non-oscillatory and high order accurate for smooth enough function  $v(x)$ . However, the approximating rational function obtained by the classical WENO reconstruction contains poles. Therefore, if one needs to obtain a value of function  $v(x)$  in the interior of the numerical cell, the standard WENO procedure needs special treatment to overcome instabilities that can occur. We will present a new polynomial version of the WENO procedure that provides an elegant solution to this problem by constructing an approximating polynomial that is smooth, non-oscillatory and high order accurate not only at the cell boundaries but in the entire numerical cell.

MSC2010: 65D15, 35L65.

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