A brief Report on the article "Constraint Preserving Schemes Using Potential–Based Flux. I. Multidimensional Transport Equations "

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Abstract: The authors consider constraint preserving multidimensional first order hyperbolic equations with a nonlinear flux function. Finite volume schemes are designed in order to approximate these equations in a stable manner and to preserve a discrete version of the constraint. The schemes are based on reformulating standard edge centered finite volume fluxes in terms of vertex centered potentials. Several numerical tests are presented.

Key words and phrases: constraint preserving multidimensional multidimensional first order hyperbolic equations; finite volume method; potential–based schemes

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1 Equation to be solved....

The authors are concerned with the evolution equations of the form:

$$u_t + L(\partial_x, f(x,t,u)) = 0, \ (x,t) \in \mathbb{R}^n \times \mathbb{R}_+, \qquad [1]$$

where $f : \mathcal{X} \to \mathcal{X}$ is a nonlinear flux function and $L : \mathcal{X} \to Y$ is a differential operator acting on the Sobolev space $\mathcal{X}$.

References

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