# A NOVEL FLUX VECTOR SPLITTING FOR A CLASS OF PDES

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Abstract. Here we briefly review the flux vector splitting approach proposed by Toro and Vázquez [1]. As applied to the Euler equations of compressible gas dynamics, the scheme has been shown to possess distinguishing features that include: complete separation of pressure terms from advection terms; exact recognition of isolated contact discontinuities and shear waves; robustness when solving exceedingly demanding shock wave problems; algorithm simplicity and computational efficiency. The approach has recently beed extended to the 3D Euler equations with general equation of state on unstructured meshes, with high order of accuracy in both space and time through application of the semi-discrete ADER methodology [2] in its finite volume version. The basic scheme can also be used in the framework of discontinuous Galerkin methods. Collaborative work in progress involves extensions to the compressible, two-phase flow equations of Baer and Nunziato, the Magnetohydrodynamics equations and the time-dependent incompressible Navier-Stokes equations. In this talk, the distinguishing features of our flux vector splitting approach are highlighted.

## References

[1] E. F. Toro and M. E. Vázquez-Cendón. Flux splitting schemes for the Euler equations. *Computers and Fluids*, 70:1–12, 2012.

[2] Eleuterio F. Toro, Cristóbal E. Castro, and Bok Jick Lee. A novel numerical flux for the 3D Euler equations with general equation of state. *Journal of Computational Physics*, In Press, 2015.

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