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HYPERBOLIC EQUATIONS: NOVEL METHODS AND APPLICATIONS

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ABSTRACT

This minisymposium is devoted to novel computational algorithms for solving hyperbolic equations and related applications. The emphasis is on novel research contributions.

On the algorithmic side this MS will consider numerical schemes addressing

- High-order space-time non-linear schemes in the frameworks of Finite Volume and Discontinuous Galerkin finite element methods, both semi-discrete and fully discrete approaches;
- Numerical fluxes for conservative systems and fluctuations for non-conservative systems;
- Schemes for hyperbolic balance laws with stiff source terms;
- Structure preserving model and methods;
- Lagrangian and Arbitrary-Lagrangian-Eulerian methods;
- Unstructured meshes, polytopal meshes and their generation and optimization;
- Hyperbolization techniques for parabolic systems.

On the applicative side this MS will include, among others:

- Environmental problems (shallow water flows, sediment transport, tsunami waves);
- Industrial problems (Euler and Navier-Stokes equations, aerodynamics, combustion, magnetohydrodynamics);
- Medical problems (human circulation, cerebrospinal fluid-dynamics, cardiovascular diseases, neurological diseases);
- Astrophysics (numerical relativity, rotating black holes, binary systems, gravitational waves).