

Thursday, Oct. 22 at 9:30 am

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Title: Structure preserving 3rd order Active Flux methods for hyperbolic balance laws

Abstract:

Active Flux is a third order accurate numerical method which evolves cell averages and point values at cell interfaces independently. It naturally uses a continuous reconstruction, but is stable when applied to hyperbolic problems because the update of the point values provides the necessary upwinding. Early versions of the method focused on linear problems where the point values could be updated exactly. E.g. for linear acoustics, it was demonstrated that the method is low Mach compliant and vorticity preserving without any fix.

In this talk, I will show a way how nonlinear problems can be tackled while maintaining third order accuracy. I will then apply Active Flux to hyperbolic systems of balance laws and present a well-balanced Active Flux method for the shallow water equations.