Thursday, Dec. 17 at 9:30 am

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Title: Asymptotic preserving scheme for the nonlinear radiation transport MHD equation

Abstract:

Asymptotic preserving scheme is poropsed for the nonlinear radiation transport MHD equation. Both the non equilibrium and equilibrium radiation diffusion MHD limit can be captured by the scheme. The advantages of our scheme are that
1) The space and time steps do not depend on the speed of the light;
2) Only macroscopic quantities, i.e. the radiation temperature, the fluid temperature have to be solved nonlinearly, while the radiation density flux can then be updated by solving a small linear system on each space grid.
3) The scheme has hyperbolic time step constraint whose CFL number does not depend on the speed of light.