

A Numerical Study on Detonation by Finite Volume Method

Guanghai Hu (胡广辉)

University of Macau

In this talk, we propose a numerical framework to study the detonation phenomenon. In the numerical framework, the reactive Euler equations are split into a standard convection process governed by nonreactive Euler equations, and a reaction process governed by a series of ODEs, by Strang splitting method. In solving Euler equations, the reconstruction is done with Non-oscillatory 1-exact reconstruction, while the HLLC flux is used for the Riemann solver. The ODE is solved with a second order RK method. OpenMP is used to accelerate the simulation in both processes. ZND theory is briefly introduced, and it is successfully shown that our result confirm the one from ZND theory. Finally, some numerical challenges will be introduced.