

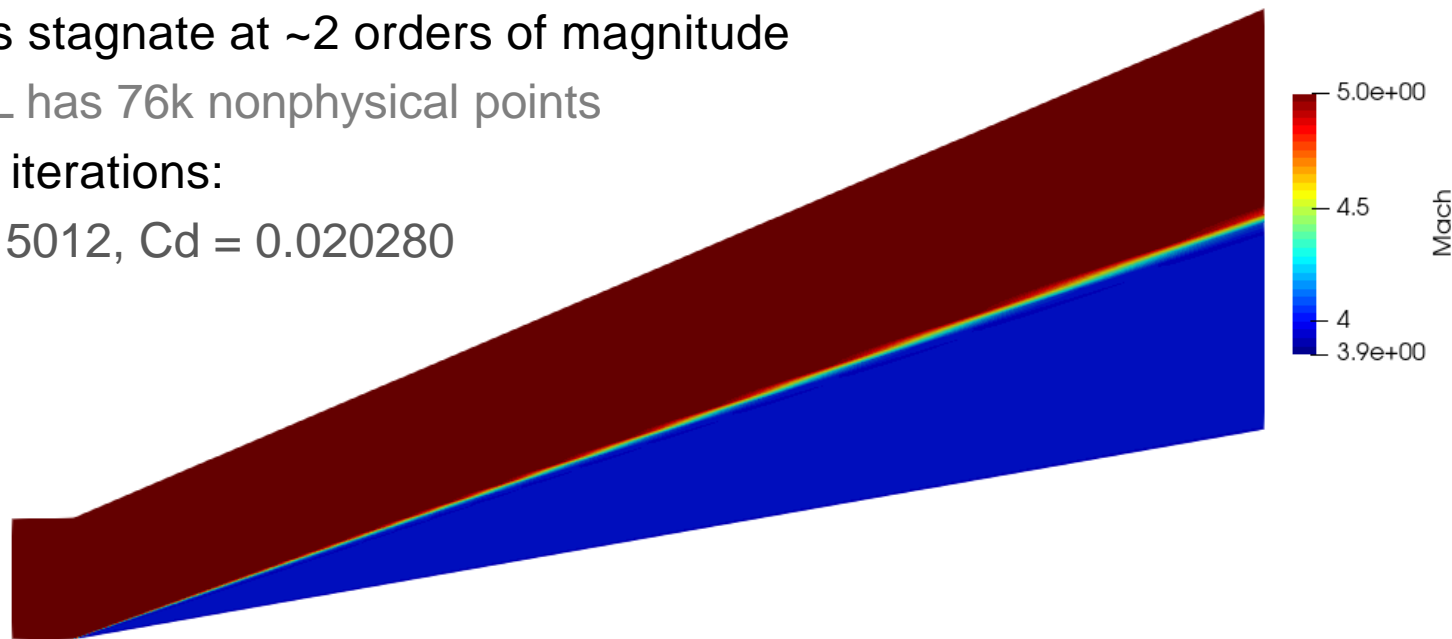
NEMO convective scheme testing

Testing NEMO schemes for PR #1885

- I. All cases run inviscid wedge at Mach=5
- II. Convective schemes: AUSM, AUSM+-Up2, Lax-Friedrich, Modified-Steger-Warming, Roe
- III. Used to calibrate the regression tests:
 - Work still needed to be done to improved robustness, accuracy and stability of some schemes

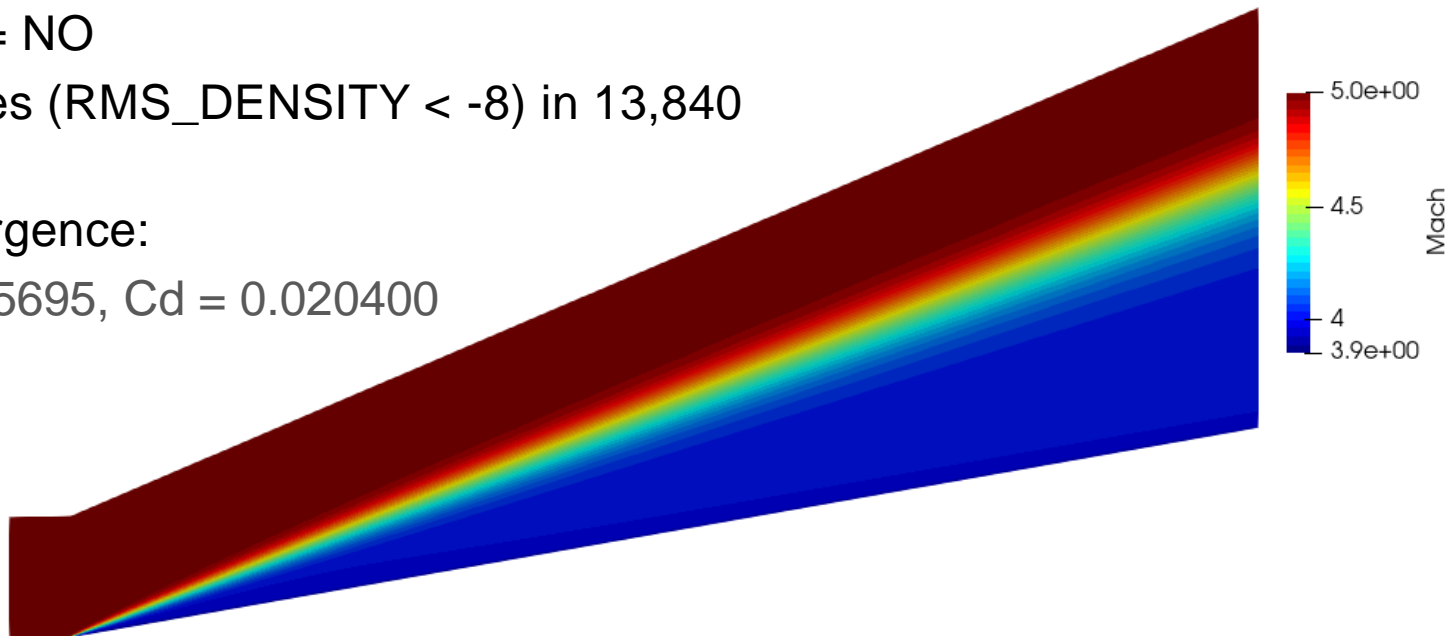
AUSM Scheme

- I. Implicit, CFL=3
- II. MUSCL, Venkatakrishnan, Coeff=0.05
- III. Residuals stagnate at ~2 orders of magnitude
 - MUSCL has 76k nonphysical points
- IV. At 10,000 iterations:
 - $Cl = -0.115012$, $Cd = 0.020280$



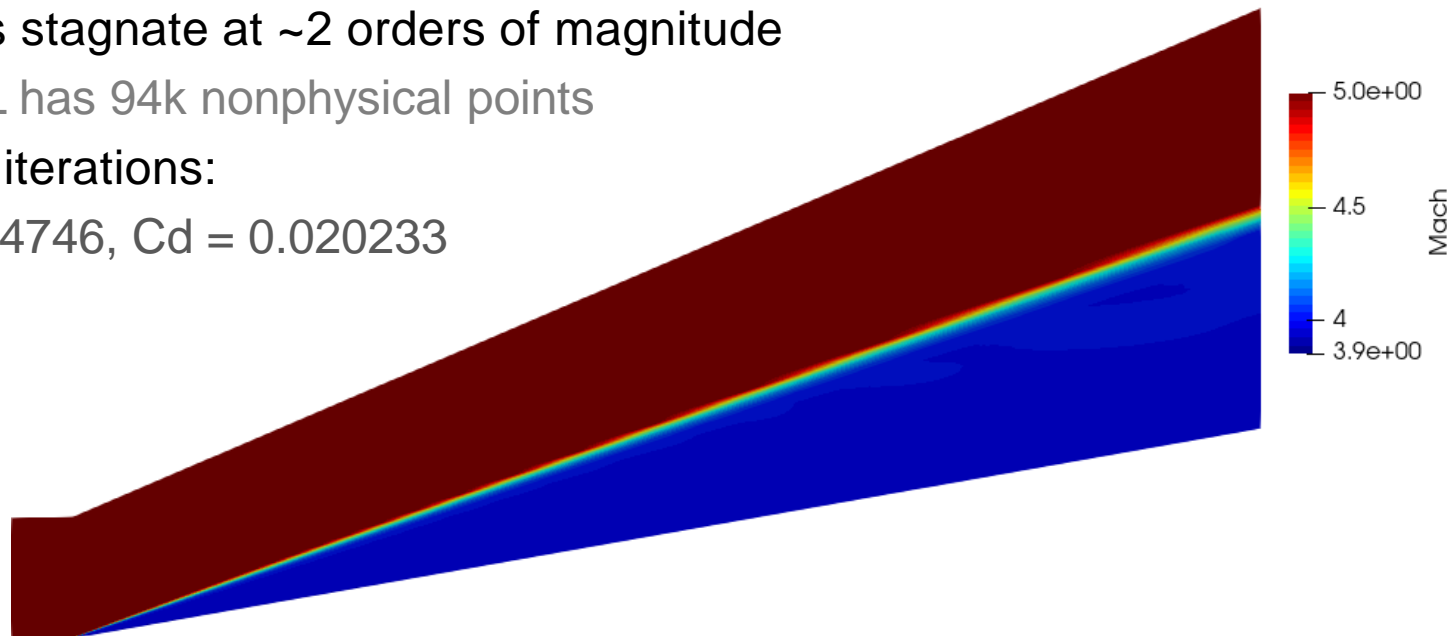
AUSM+-UP2 Scheme

- I. Explicit, CFL=0.25
 - Scheme struggles to converge at larger CFLs
- II. MUSCL = NO
- III. Converges (RMS_DENSITY < -8) in 13,840 iterations
- IV. At convergence:
 - $C_l = -0.115695$, $C_d = 0.020400$



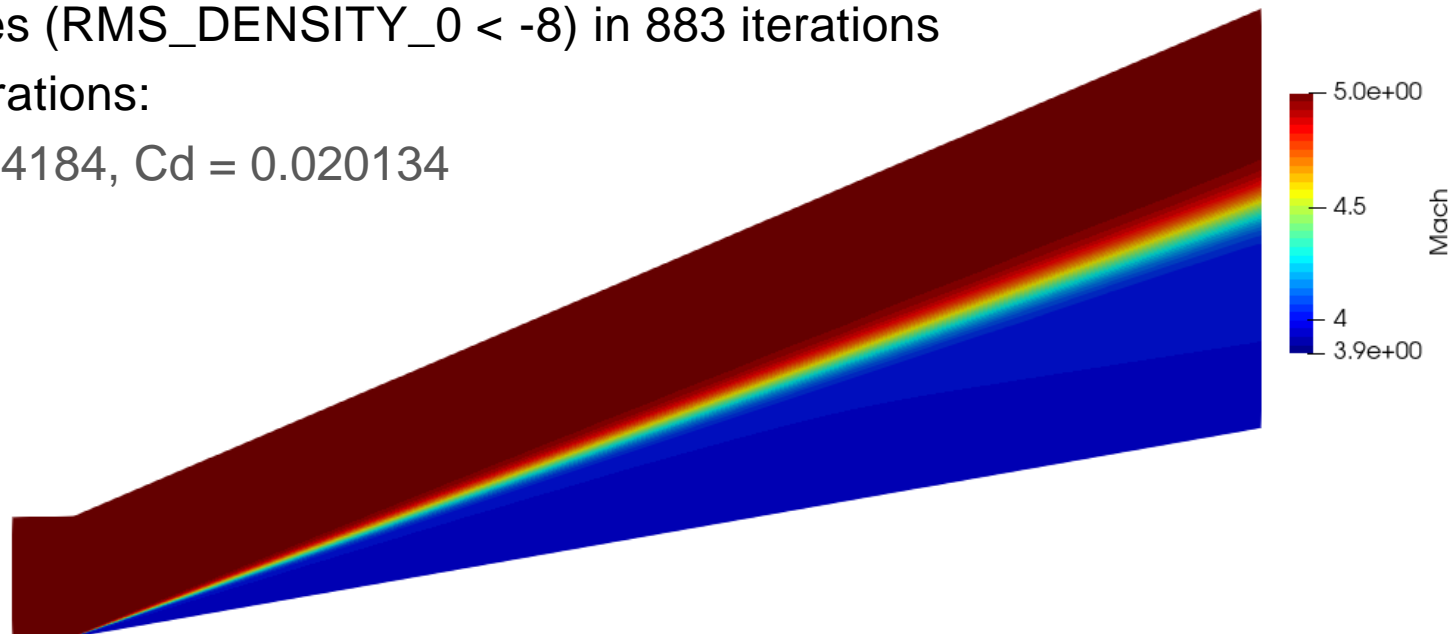
MSW Scheme

- I. Implicit, CFL=3
- II. MUSCL, Venkatakrishnan, Coeff=0.05
- III. Residuals stagnate at ~2 orders of magnitude
 - MUSCL has 94k nonphysical points
- IV. At 10,000 iterations:
 - $Cl = -0.114746$, $Cd = 0.020233$



LAX-FRIEDRICH Scheme

- I. Implicit, CFL=3
- II. MUSCL, Venkatakrishnan, Coeff=0.05
- III. Converges ($\text{RMS_DENSITY_0} < -8$) in 883 iterations
- IV. At 883 iterations:
 - $C_l = -0.114184$, $C_d = 0.020134$



ROE Scheme

- I. Implicit, CFL=3
- II. MUSCL, Venkatakrishnan, Coeff=0.05
- III. Residuals stagnate at ~2 orders of magnitude
 - MUSCL has 91k nonphysical points
- IV. At 10,000 iterations:
 - $Cl = -0.114862$, $Cd = 0.020254$

