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Interface reconstruction and sub-zone physics models

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Interface reconstruction and sub-zone physics models *

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Numerical methods for MM fluid flows
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Outline of presentation



- Review of code physics
 - Lagrangian hydro
 - Rezoning models
 - Multi-material setup
- Interface reconstruction
 - Cell decomposition
 - Iteration techniques
 - Priority ordering scheme
- Sub-zone physics models
 - Pressure equilibration
 - Temperature equilibration
 - PdV work allocation
- Examples
- Summary and conclusions



Code physics

- Lagrangian hydro
 - Regular mesh connectivity
 - Staggered grid (space and time)
 - Second order
- Thermal response
 - Electron and ion conduction
 - Electron-ion coupling
 - Radiative transfer
- Material response
 - Equation of state
 - Chemistry
 - Strength and failure models
- Laser propagation
 - Absorption and refraction
 - Scattering



ALE rezoning models

- Discrete:
 - Handles arbitrary mesh overlays
 - Employs triangular decomposition
 - Second order van Leer (pure zones)
 - First order (mixed cells)
 - Equi-potential smoothing by default
 - Substantially parallel
- Continuous:
 - Requires substantial mesh overlaps
 - Second order van Leer (pure zones)
 - Uses discrete re-map for mixed cells
 - High quality momentum re-map