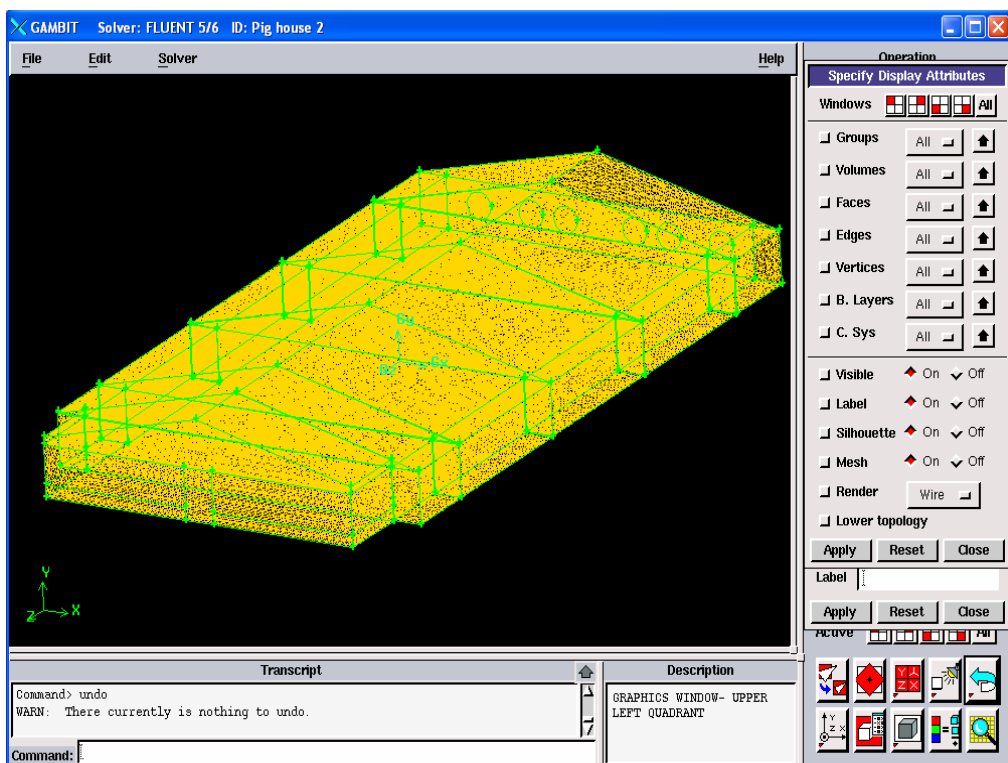
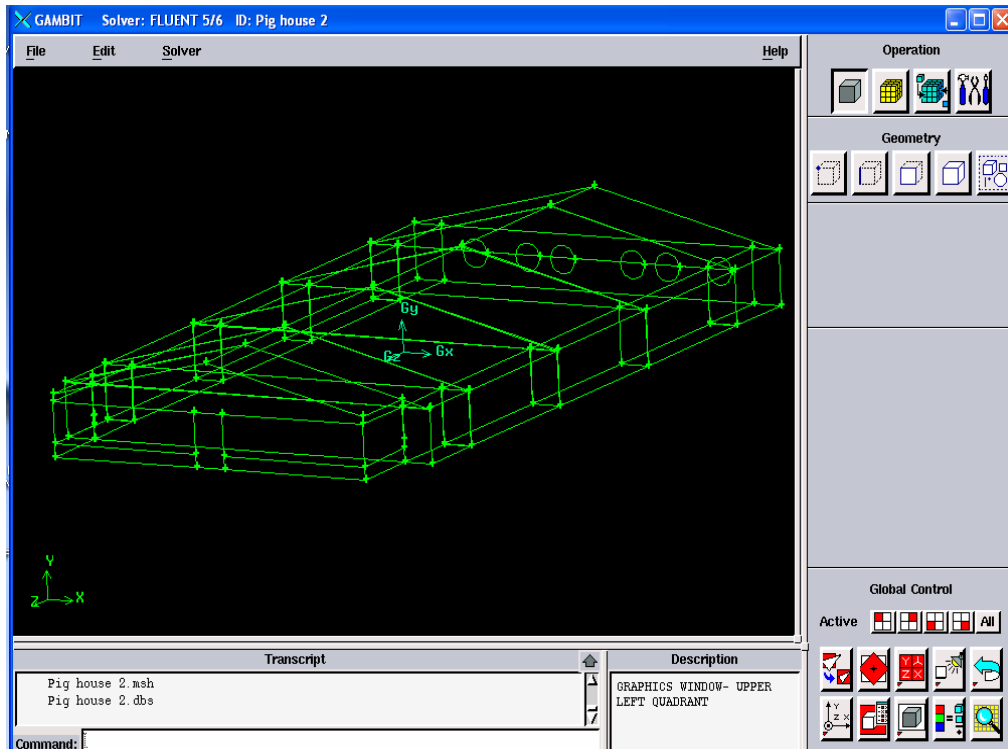
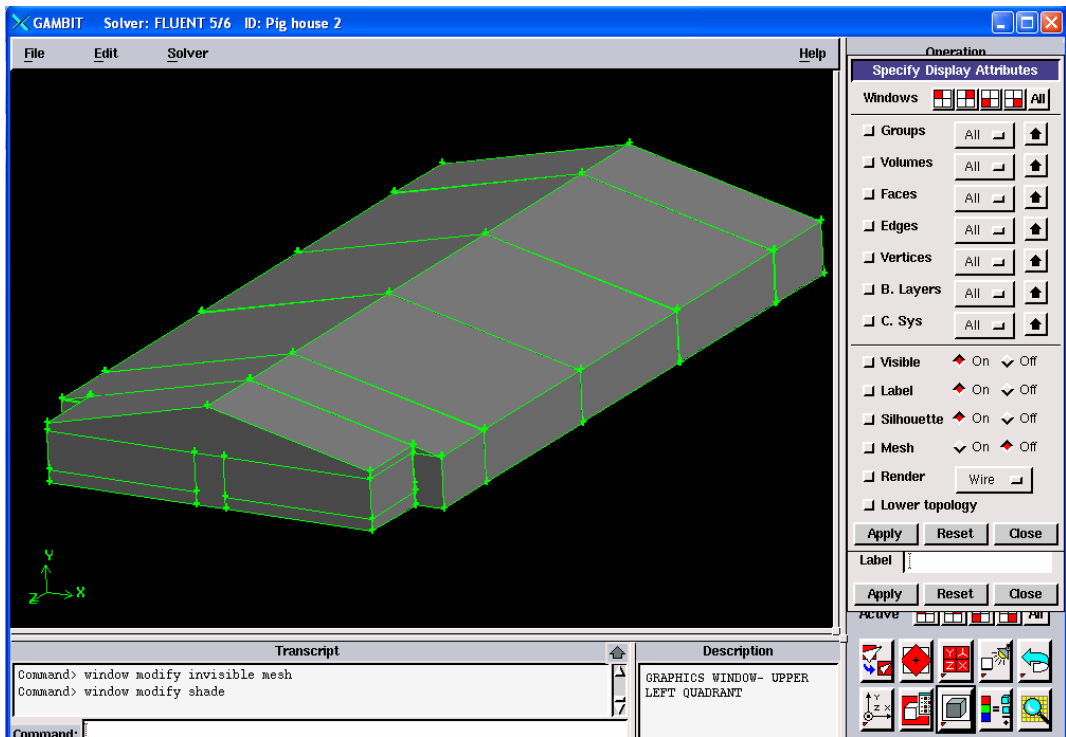


ภาคผนวก
กระบวนการวิเคราะห์โดยโปรแกรม CFD

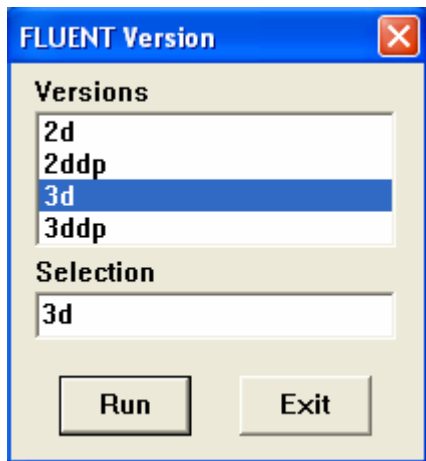
กระบวนการวิเคราะห์ด้วย CFD



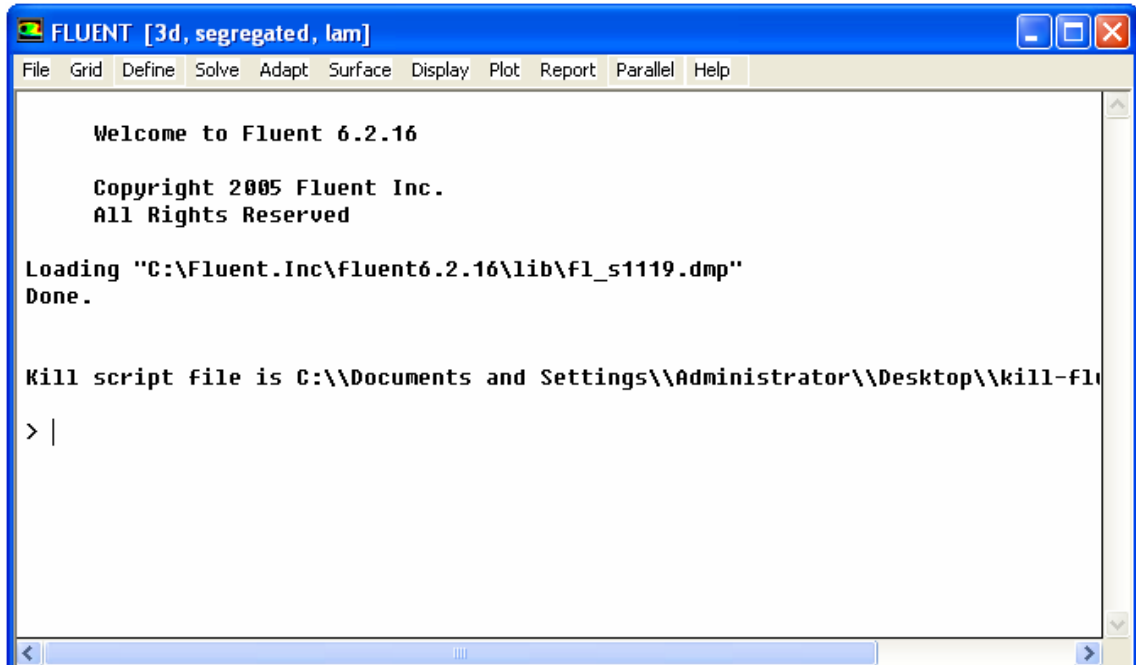


ขั้นตอน FLUENT

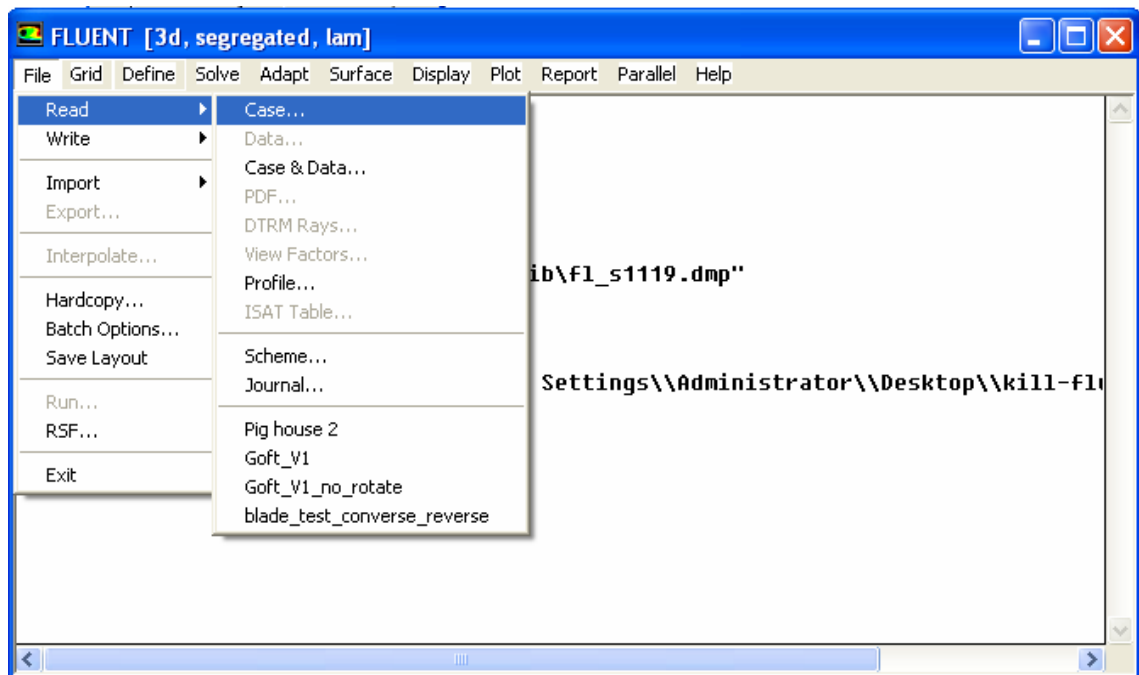
1. 3D

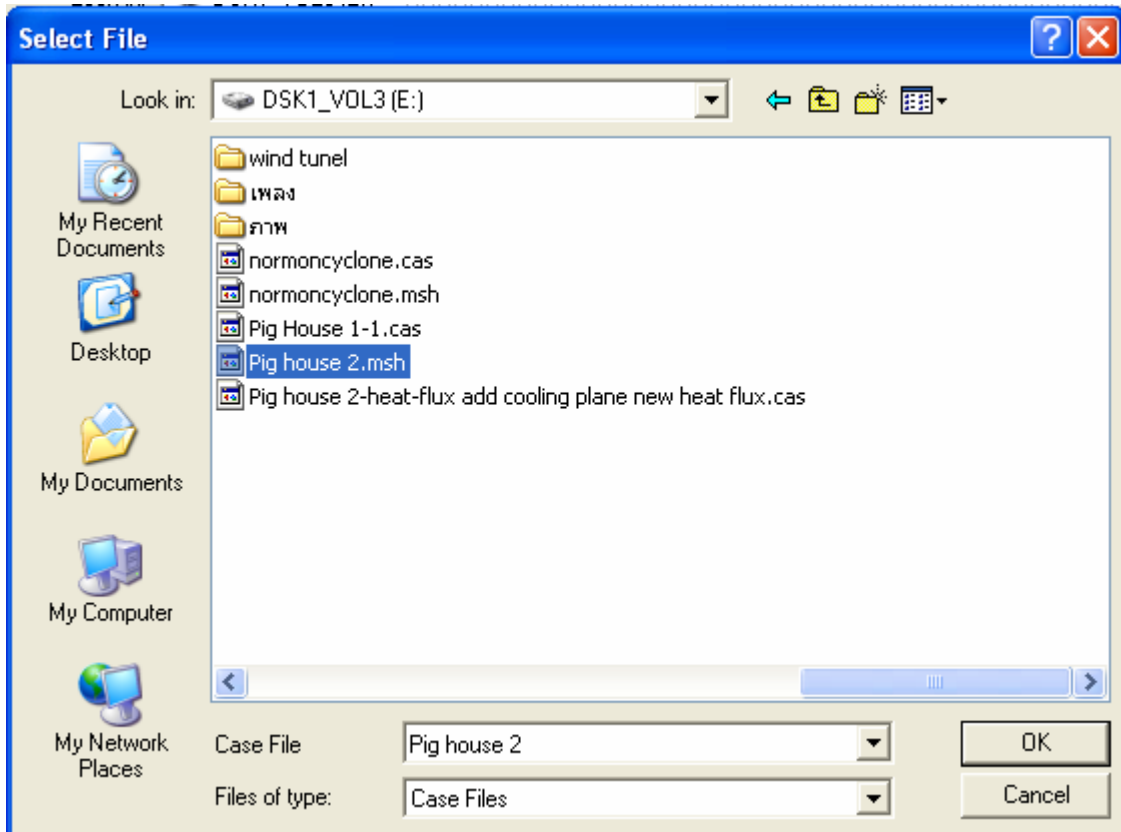


2. FLUENT windows

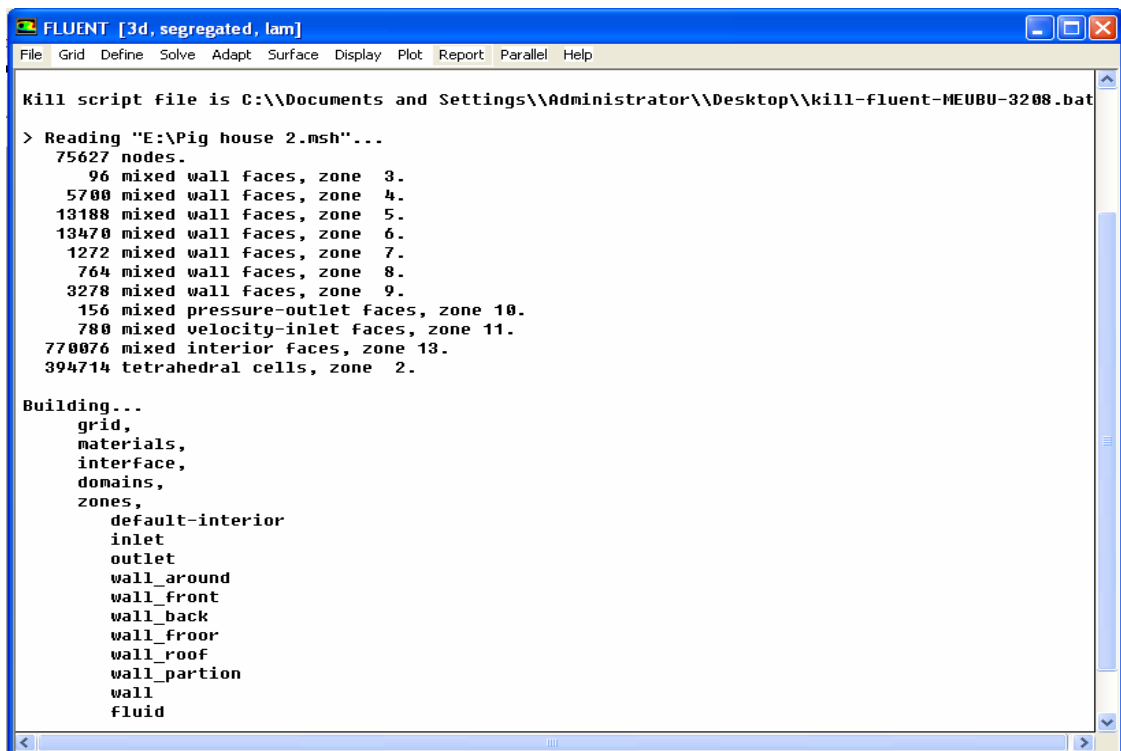


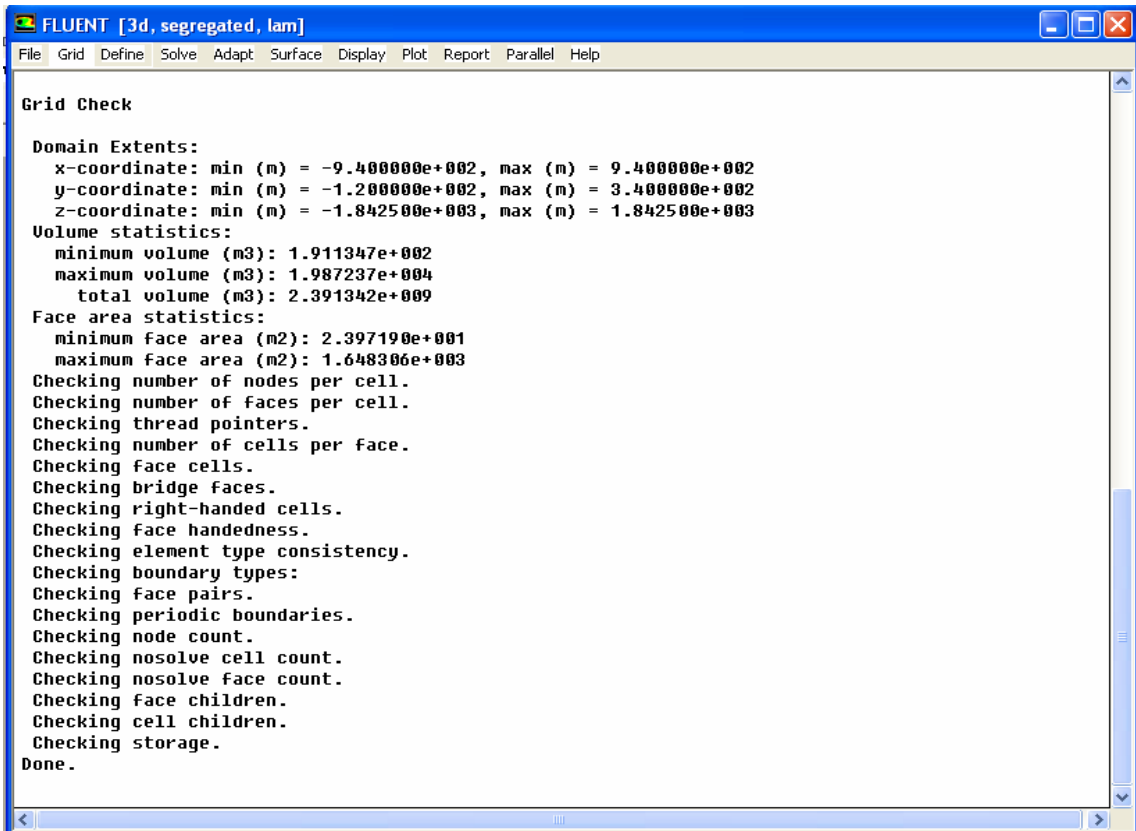
3. Read mesh



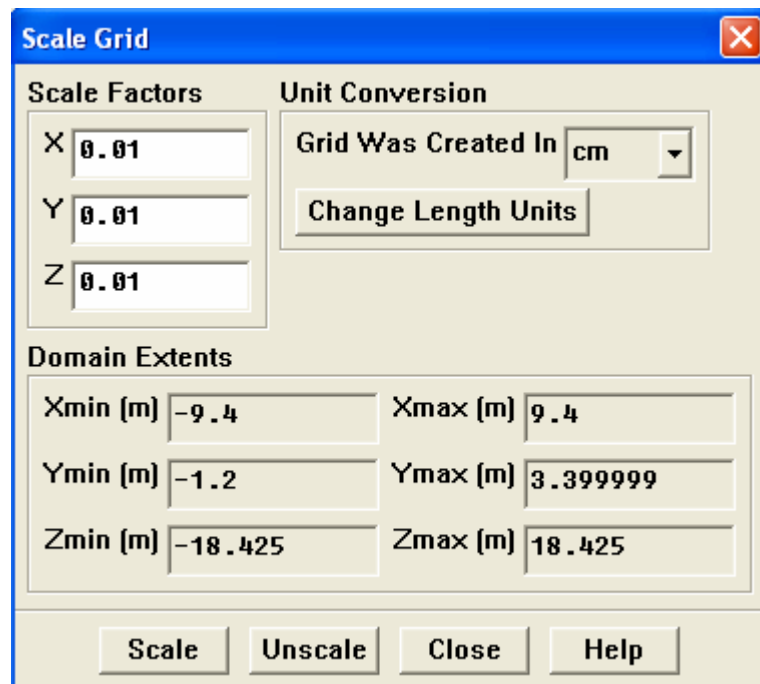


4. Import and Check grid

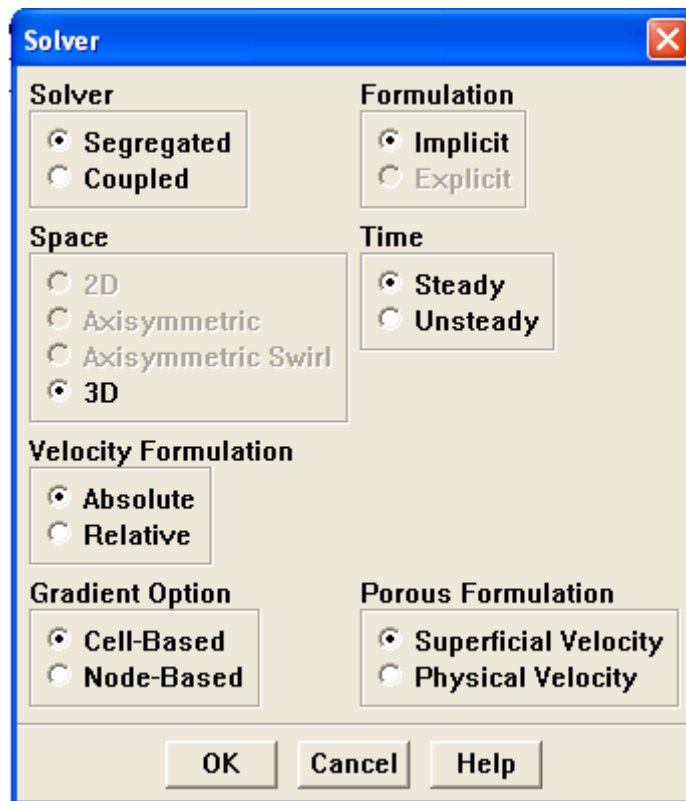




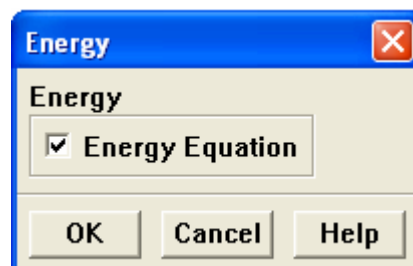
5. Scale



6. Define → Model → Solver



7. Define → Model → Energy



8. Define → Model → Viscous

Viscous Model

Model

- Inviscid
- Laminar
- Spalart-Allmaras (1 eqn)
- k-epsilon (2 eqn)
- k-omega (2 eqn)
- Reynolds Stress (7 eqn)
- Detached Eddy Simulation
- Large Eddy Simulation

k-epsilon Model

- Standard
- RNG
- Realizable

Near-Wall Treatment

- Standard Wall Functions
- Non-Equilibrium Wall Functions
- Enhanced Wall Treatment

Options

- Viscous Heating
- Full Buoyancy Effects

Model Constants

Cmu: 0.09

C1-Epsilon: 1.44

C2-Epsilon: 1.92

TKE Prandtl Number: 1

User-Defined Functions

Turbulent Viscosity

none

Prandtl Numbers

TKE Prandtl Number: none

TDR Prandtl Number: none

Energy Prandtl Number: none

OK Cancel Help

9. Define → Material (Air default)

The screenshot shows the 'Materials' dialog box with the following configuration:

Name	Material Type	Order Materials By
air	fluid	<input checked="" type="radio"/> Name <input type="radio"/> Chemical Formula

Chemical Formula: [Empty]
Fluent Fluid Materials: air
Mixture: none

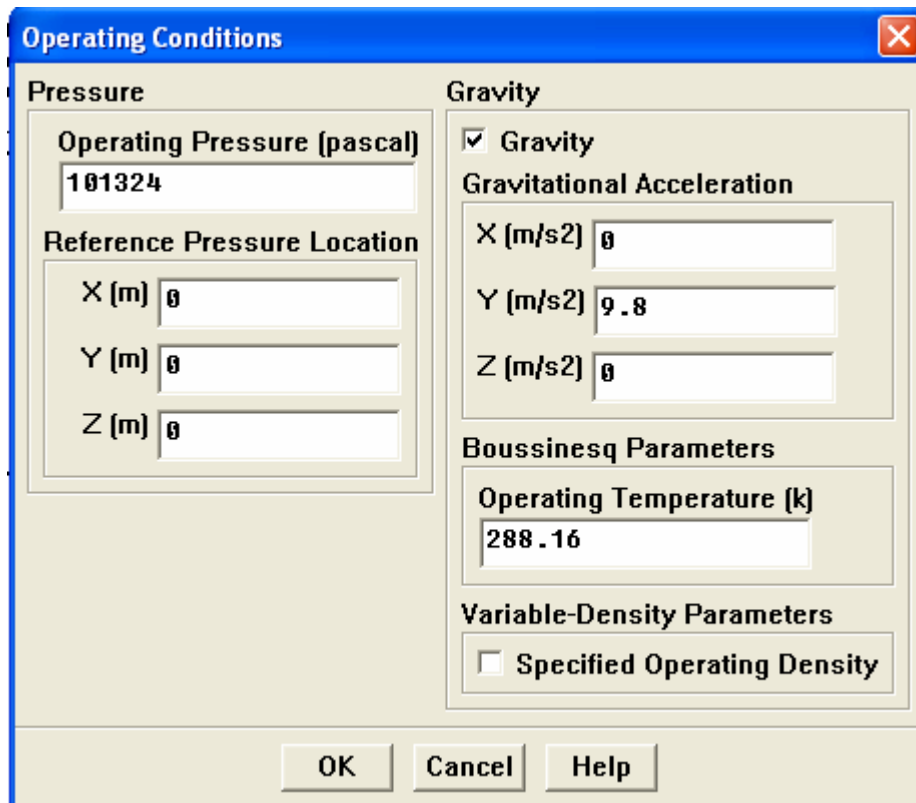
Buttons: Fluent Database..., User-Defined Database...

Properties:

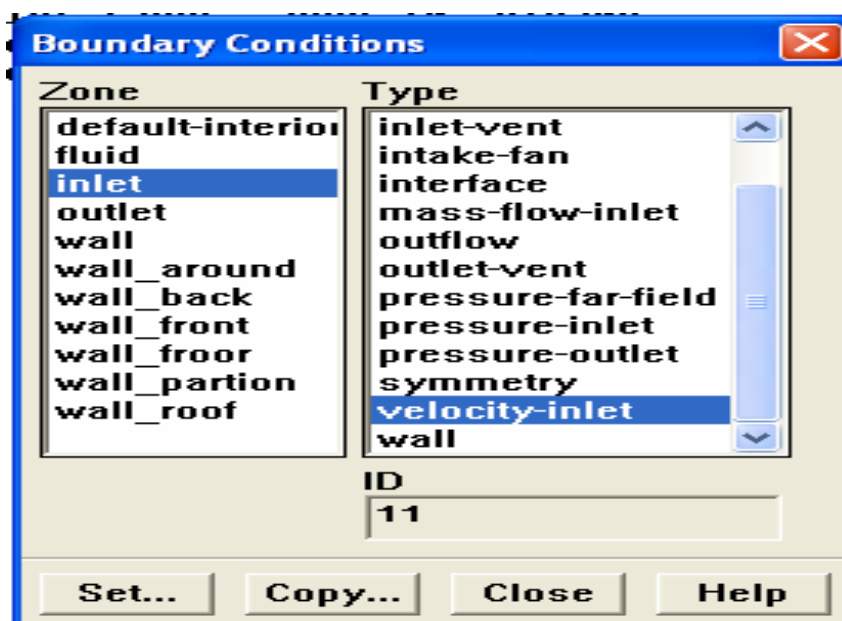
Property	Value
Density (kg/m ³)	constant 1.225
Cp (j/kg-k)	constant 1006.43
Thermal Conductivity (w/m-k)	constant 0.0242
Viscosity (kg/m-s)	constant 1.7894e-05

Buttons: Change/Create, Delete, Close, Help

10. Define → Operating conditions



11. Define → Boundary conditions



11.1 Inlet

Velocity Inlet ✕

Zone Name

Velocity Specification Method **Magnitude, Normal to Boundary** ▾

Reference Frame **Absolute** ▾

Velocity Magnitude (m/s) **constant** ▾

Temperature (k) **constant** ▾

Turbulence Specification Method **Intensity and Viscosity Ratio** ▾

Turbulence Intensity (%)

Turbulent Viscosity Ratio

11.2 Outlet

Pressure Outlet ✕

Zone Name

Gauge Pressure (pascal) **constant** ▾

Radial Equilibrium Pressure Distribution

Backflow Total Temperature (k) **constant** ▾

Backflow Direction Specification Method **Normal to Boundary** ▾

Turbulence Specification Method **Intensity and Viscosity Ratio** ▾

Backflow Turbulence Intensity (%)

Backflow Turbulent Viscosity Ratio

Target mass-flow rate

11.3 ผนังด้านข้าง

Wall

Zone Name
wall_around

Adjacent Cell Zone
fluid

Thermal | DPM | Momentum | Species | Radiation | UDS | Granular

Thermal Conditions

Heat Flux
 Temperature
 Convection
 Radiation
 Mixed

Heat Flux (w/m²) 30 constant

Wall Thickness (m) 0

Heat Generation Rate (w/m³) 0 constant

Shell Conduction

Material Name
gypsum Edit...

OK Cancel Help

11.4 หลังคา

Wall

Zone Name
wall_roof

Adjacent Cell Zone
Fluid

Thermal | DPM | Momentum | Species | Radiation | UDS | Granular

Thermal Conditions

- Heat Flux
- Temperature
- Convection
- Radiation
- Mixed

Heat Flux [w/m2] 12 constant

Wall Thickness (m) 0

Heat Generation Rate (w/m3) 0 constant

Shell Conduction

Material Name
gypsum Edit...

OK Cancel Help

12. Solve → Initialize → Initialize

Solution Initialization

Compute From

Reference Frame

- Relative to Cell Zone
- Absolute

Initial Values

Gauge Pressure (pascal) 101324

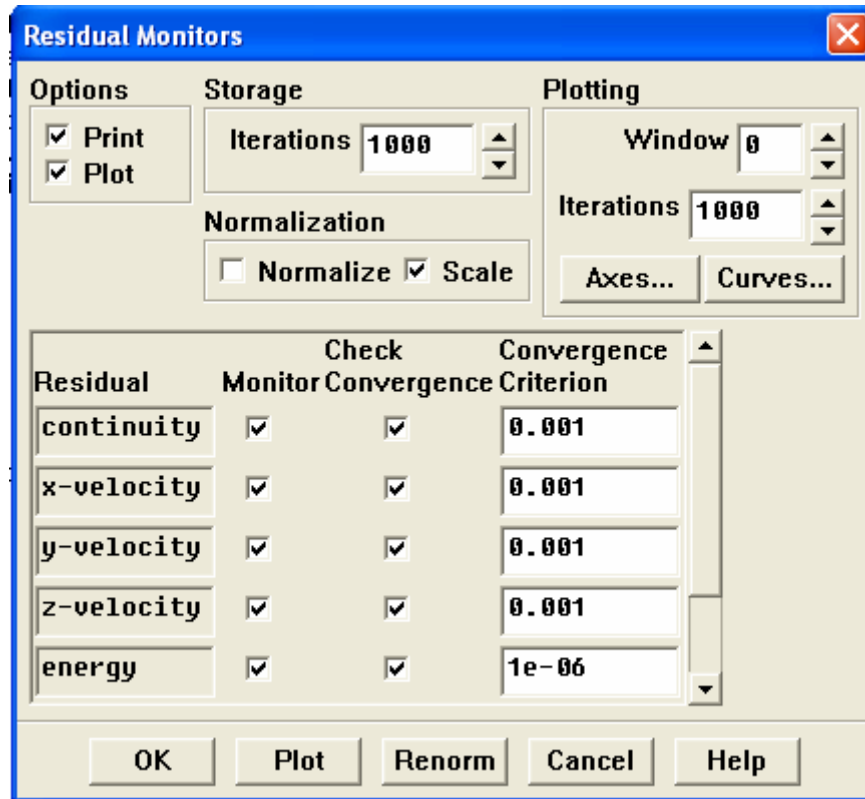
X Velocity (m/s) 0

Y Velocity (m/s) 0

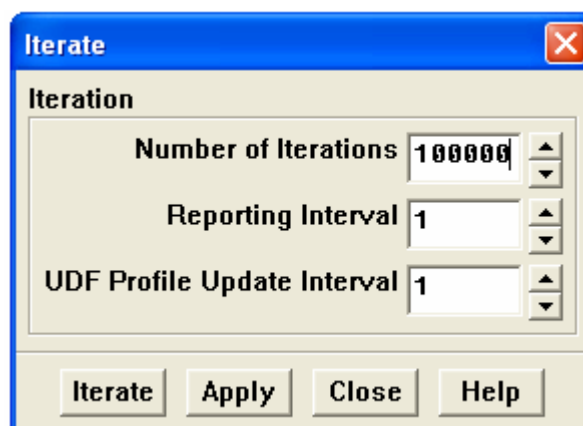
Z Velocity (m/s) 0

Init Reset Apply Close Help

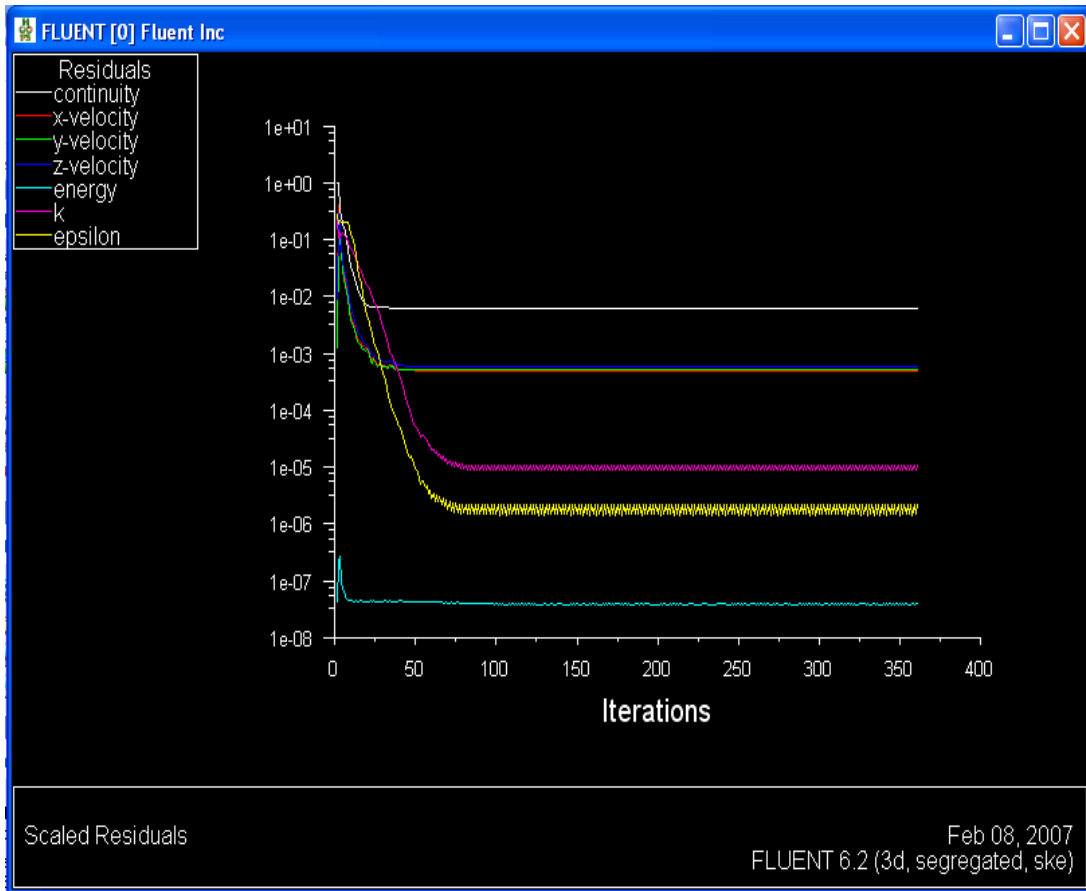
13.Solve → Monitor → Residual



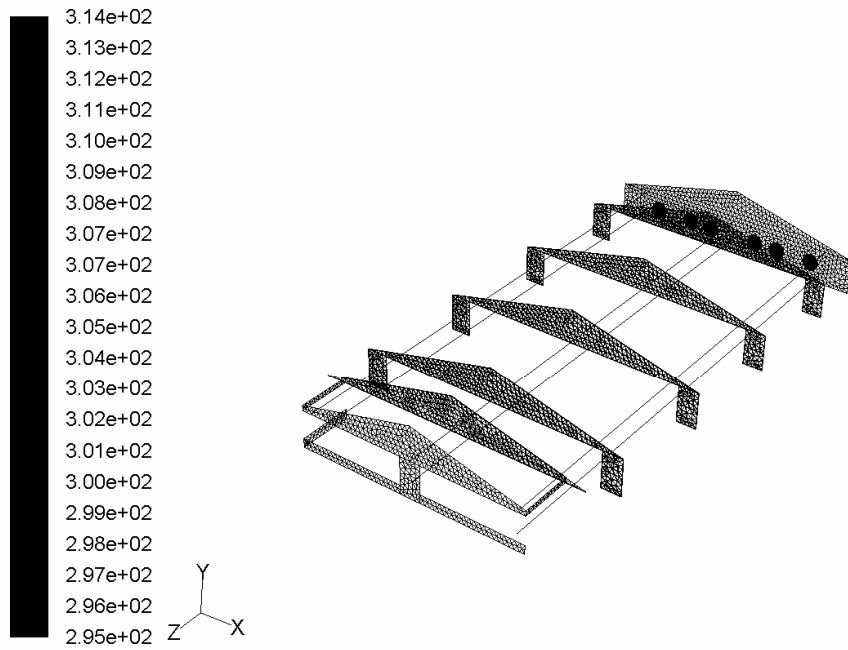
14.Solve → Iterate



15. Residual

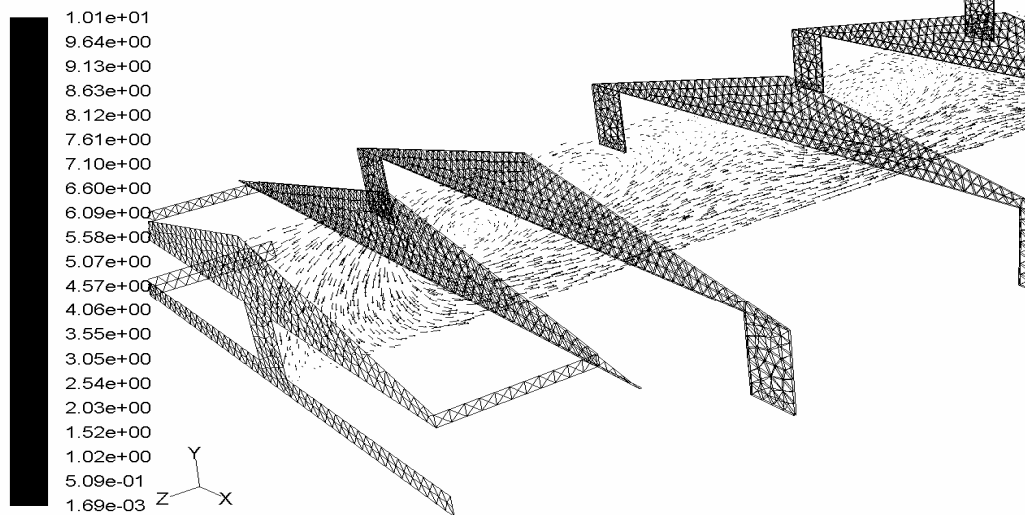


Result



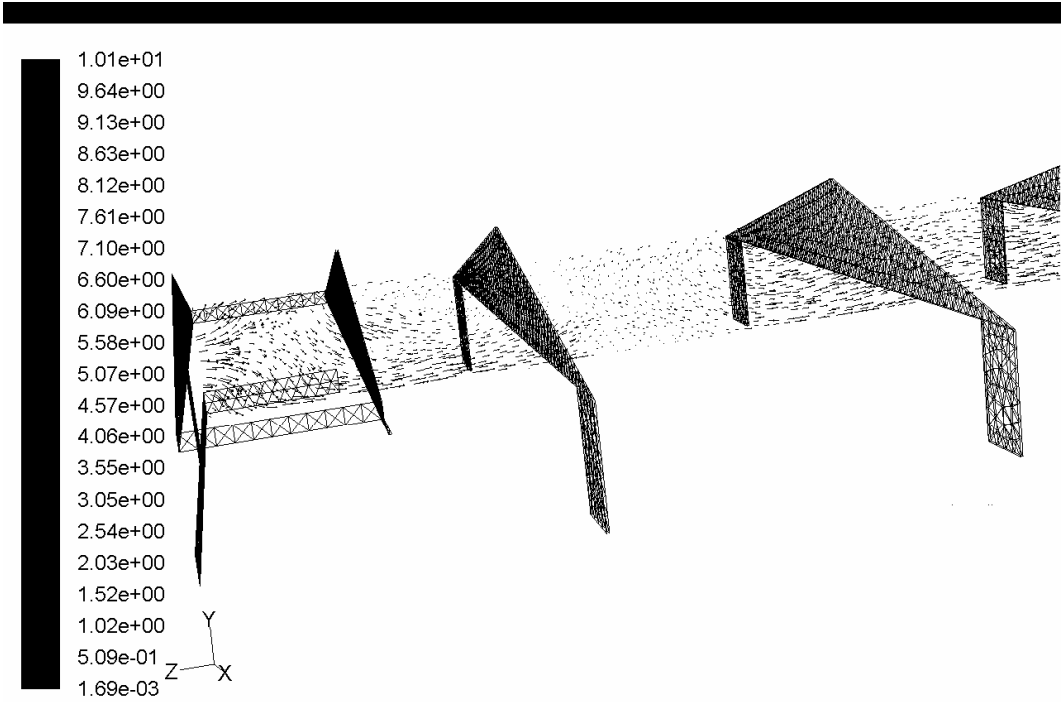
Contours of Static Temperature (k)

Feb 08, 2007
FLUENT 6.2 (3d, segregated, ske)

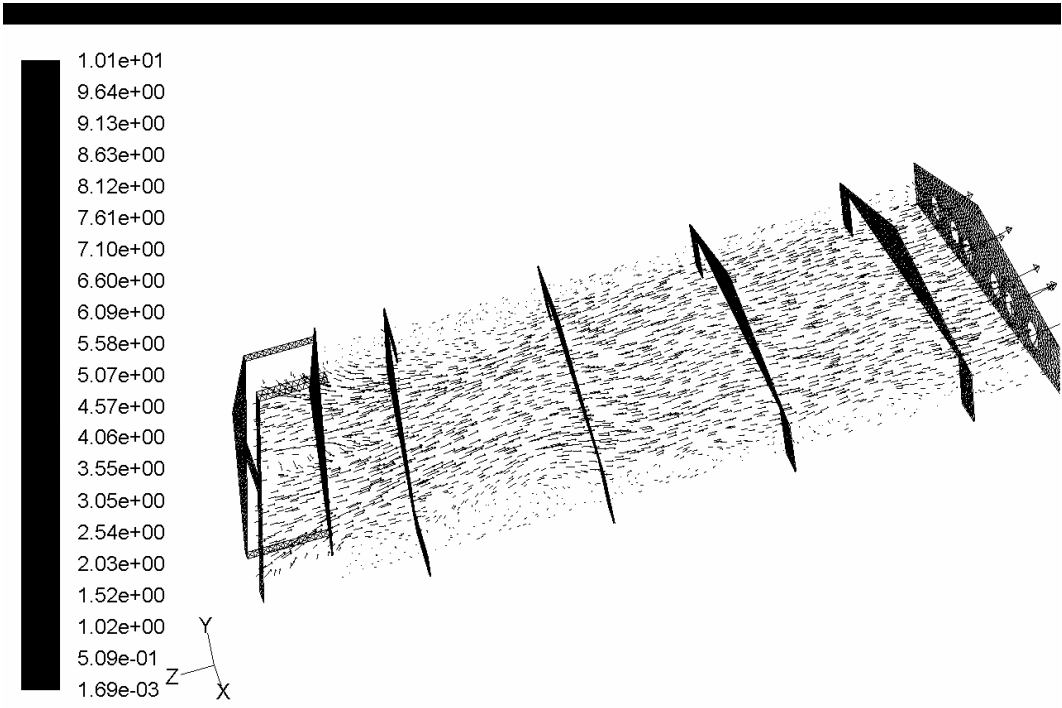


Velocity Vectors Colored By Velocity Magnitude (m/s)

Feb 08, 2007
FLUENT 6.2 (3d, segregated, ske)



Velocity Vectors Colored By Velocity Magnitude (m/s) Feb 08, 2007
 FLUENT 6.2 (3d, segregated, ske)



Velocity Vectors Colored By Velocity Magnitude (m/s) Feb 08, 2007
 FLUENT 6.2 (3d, segregated, ske)

