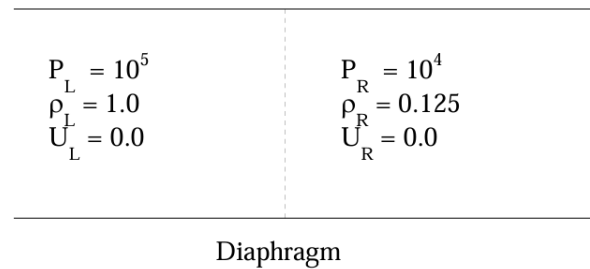


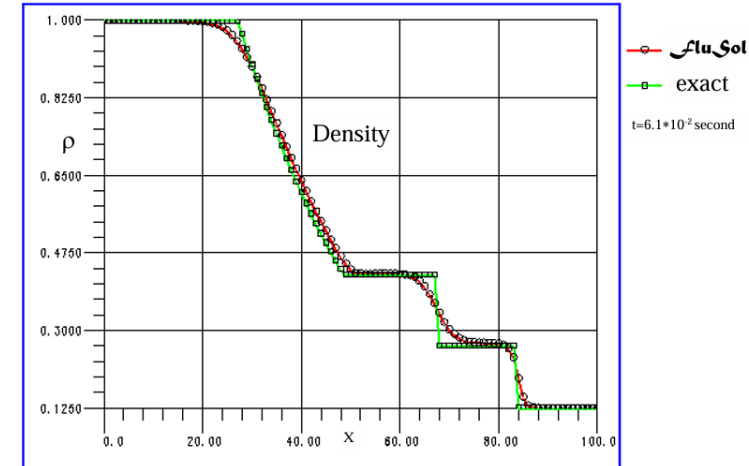
Problem: Transient Solution at 6.1 μ Second for The Sod's Shock Tube

- * 1D planar flow
- * Exact Riemann solution

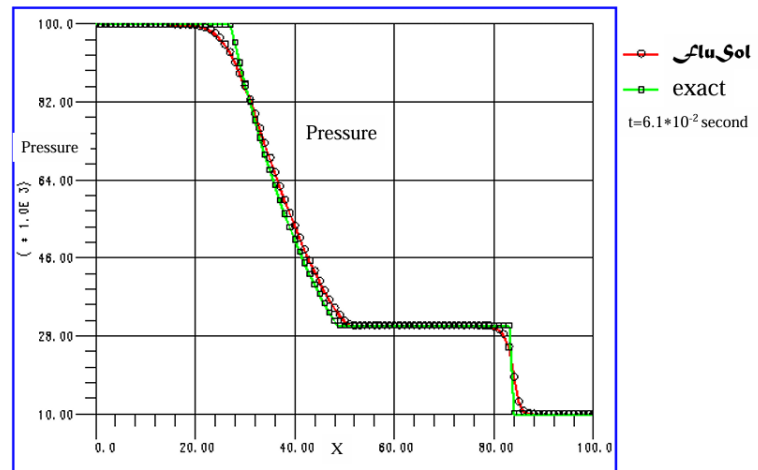


Computational domain for one dimensional shock tube problem.

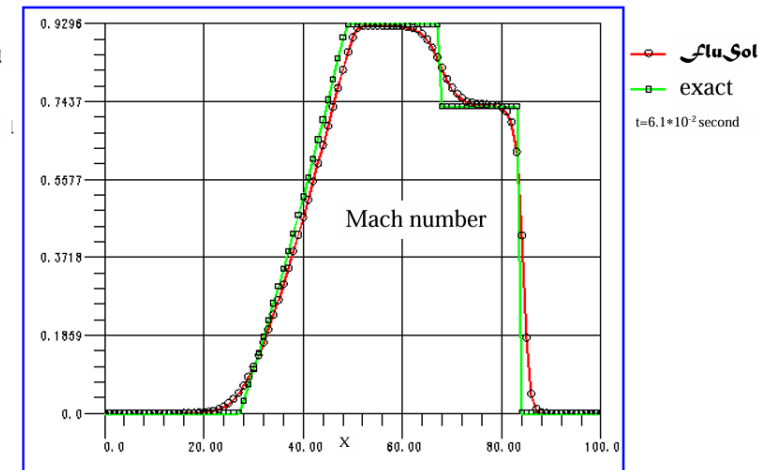
- * Shock tube problem
- * Transient solution



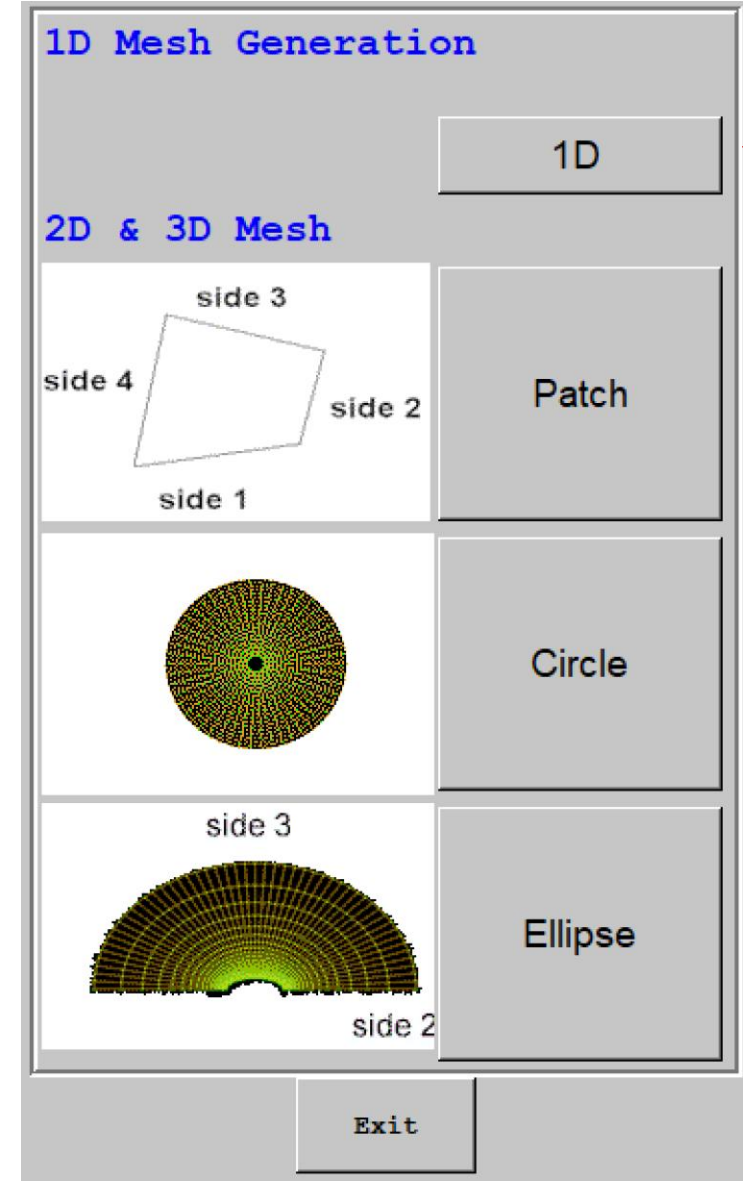
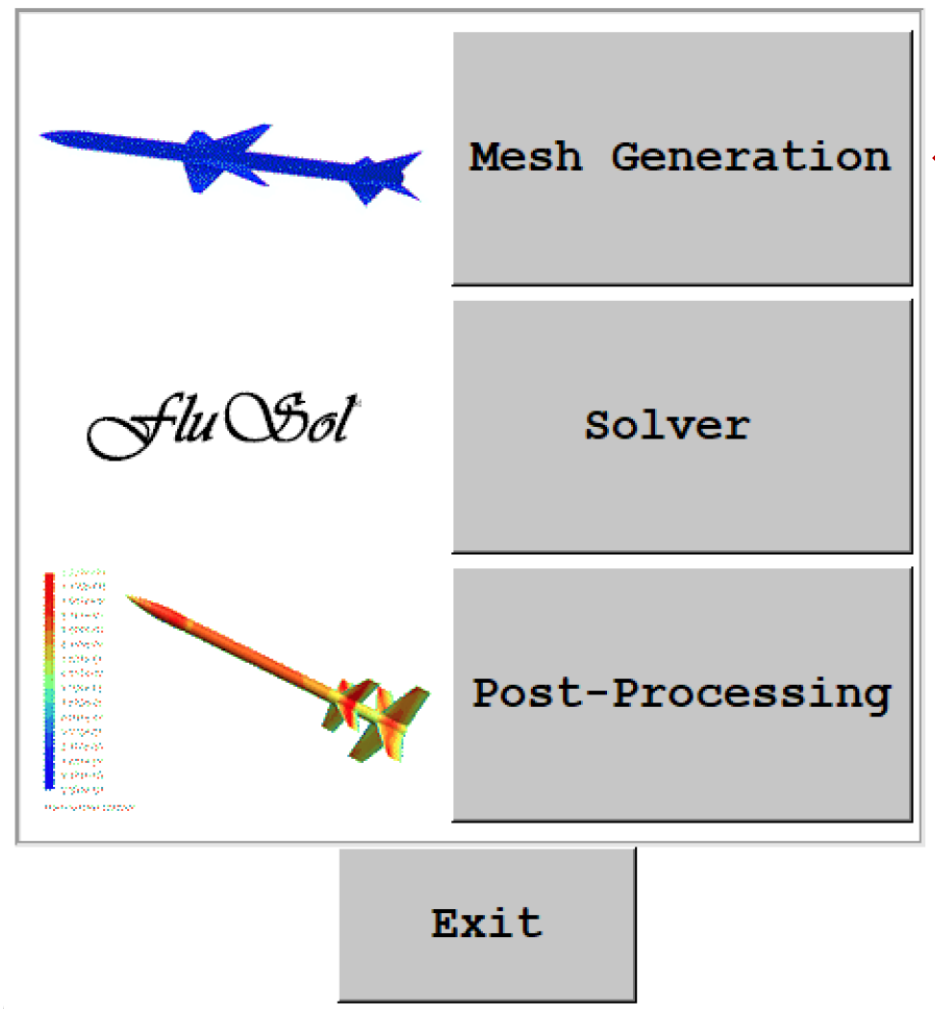
Density distribution at 6.1×10^{-2} second after the diaphragm was broken.



Pressure distribution at 6.1×10^{-2} second after the diaphragm was broken.



Mach number distribution at 6.1×10^{-2} second after the diaphragm was broken.



74 *** 1D - FluSol 1D Mesh Generator: Version 1.0 ***

File

1D Mesh Initial Conditions

3

1D Mesh Generation

☒ 1D Plane ☐ 1D Cylinder ☐ 1D Sphere

Left end coordinate: 0.0

Total elements: 100

Diaphragm Location: 51.0

Residue: 1e-006

DT: 0.00001

Right end coordinate: 1.0

DX: 0.01

Number of iterations: 61

maximum iteration number: 2001

Side End Boundary Conditions

Left end opened/closed

☒ opened ☐ closed

☒ opened ☐ closed

Right end opened/closed

☐ closed ☐ closed

Preview Mesh Write mesh (*.msh) Exact Solution

Exit

7% *** 1D - FluSol 1D Mesh Generator: Version 1.0 ***

File 12

1D Mesh Initial Conditions

1D Mesh Generation

☒ 1D Plane 3 ☒ 1D Cylinder 4 ☐ 1D Sphere

Left end coordinate 0.0 8
Total elements 100 8
Diaphragm Location 51.0 9
Residue 1e-006
DT 0.00004

Right end coordinate 1.0
DX 0.01 7
Number of iterations 61
maximum iteration number 2001

Side End Boundary Conditions

Left end opened/closed
☒ opened 10
☒ opened 11
☐ closed

Right end opened/closed
☐ closed
☐ closed

Preview Mesh Write mesh (*.msh) Exact Solution

Exit

7% *** 1D - FluSol 1D Mesh Generator: Version 1.0 ***

File

1D Mesh Initial Conditions

Initial Conditions

Left Hand Side		Right Hand Side	
Density Reg.4	1.0	Density Reg.1	0.125
UX Reg.4	1.0	UX Reg.1	1.0
Pressure Reg.4	1.0E5	Pressure Reg.1	1.0E4
GAMMA Reg.4	1.4	GAMMA Reg.1	1.4
Temperature Reg.4	1.0	Temperature Reg.1	1.0

7% *** 1D - FluSol 1D Mesh Generator: Version 1.0 ***

File

1D Mesh Initial Conditions

1D Mesh Generation

☒ 1D Plane ☐ 1D Cylinder ☐ 1D Sphere

Left end coordinate	0.0	Right end coordinate	1.0
Total elements	100	DX	0.01
Diaphragm Location	51.0	Number of iterations	61
Residue	1e-006	maximum iteration number	2001
DT	0.00001		

Side End Boundary Conditions

Left end opened/closed	Right end opened/closed
☒ opened	☐ closed
☒ opened	☐ closed

Preview Mesh Write mesh (*.msh) Exact Solution

Exit

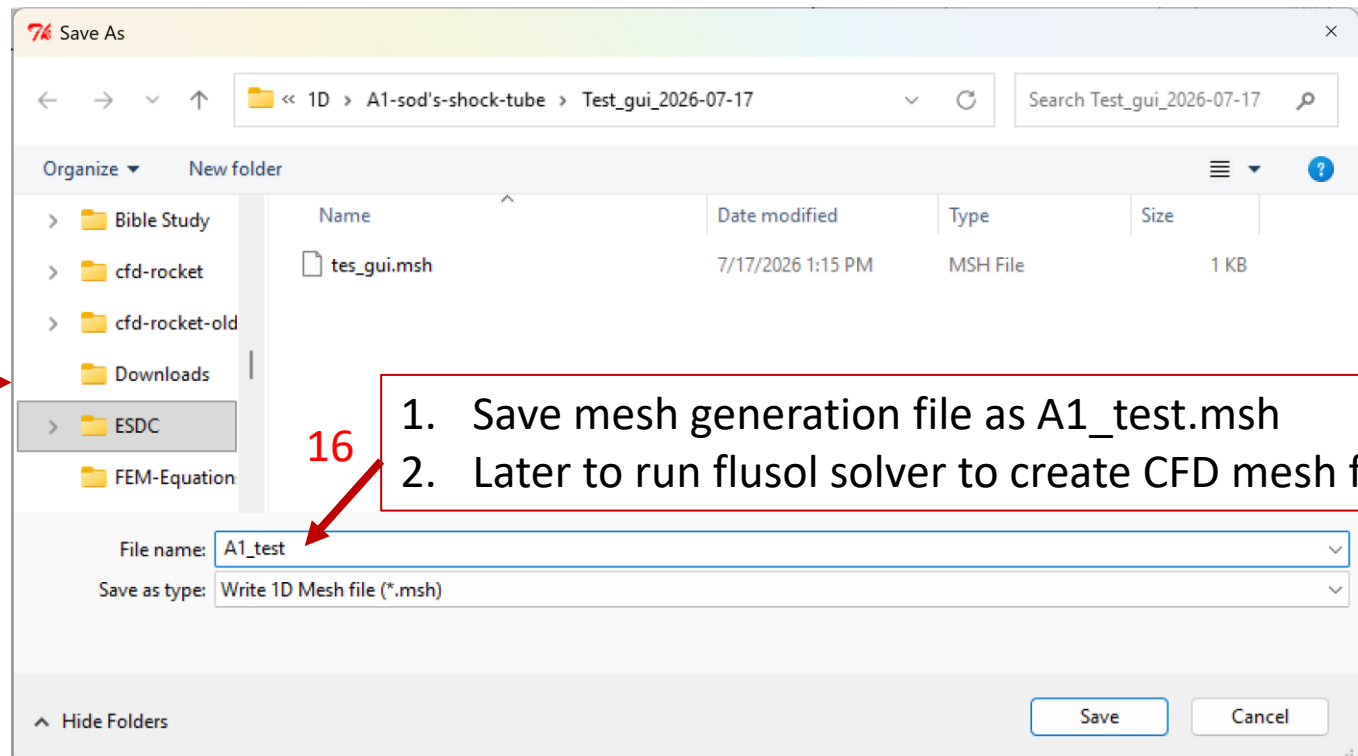
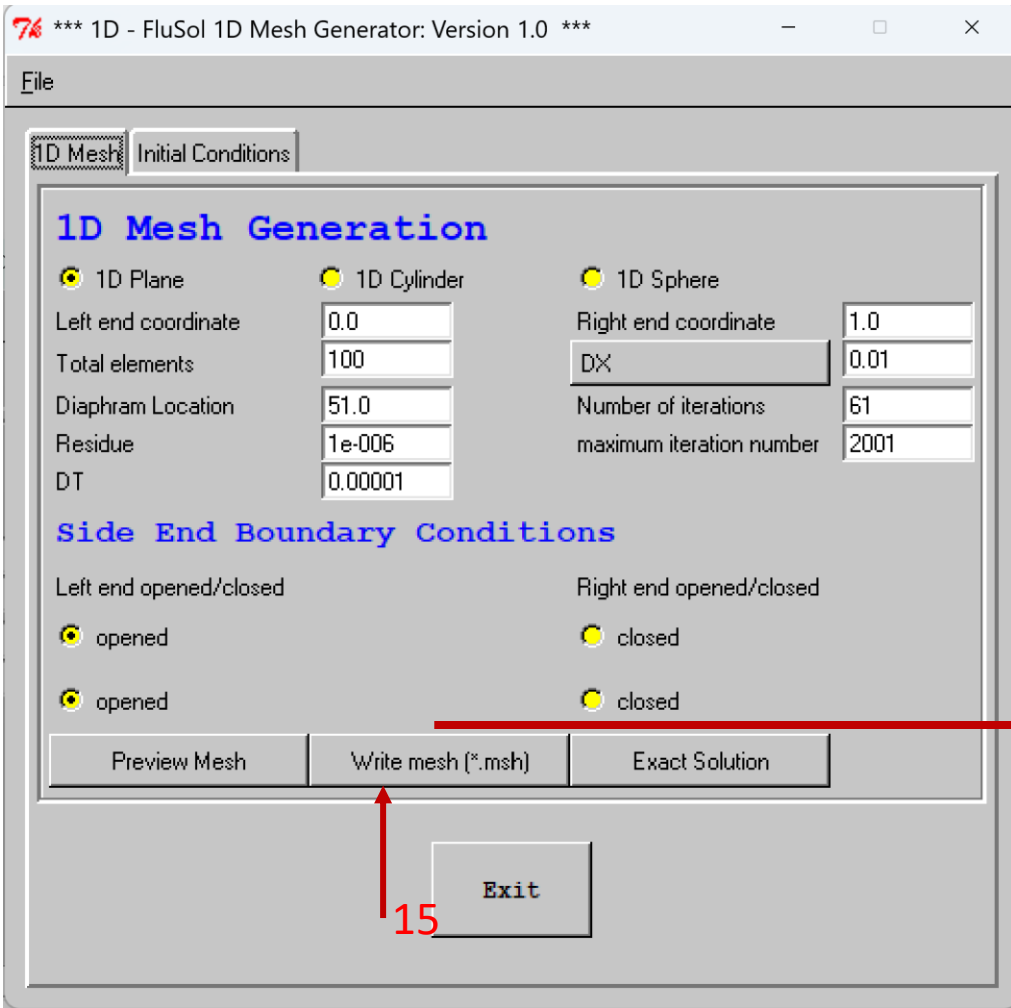
15

7% Preview

1D Mesh File

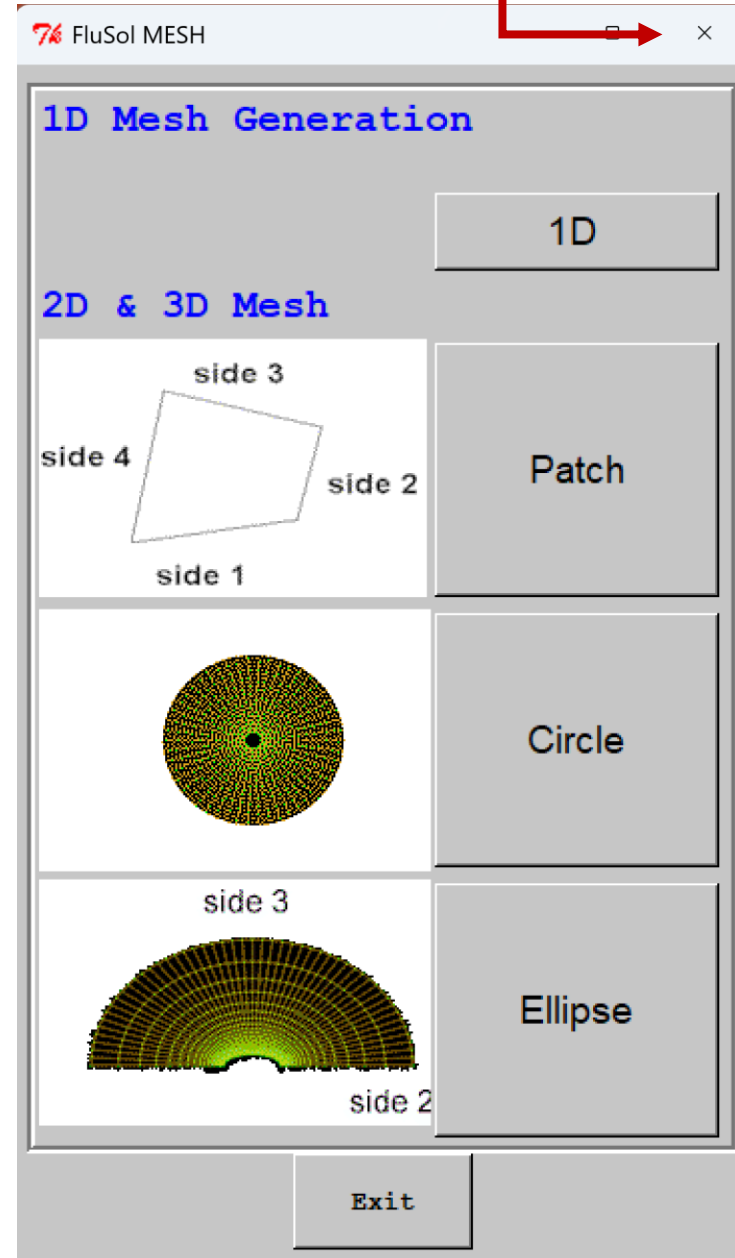
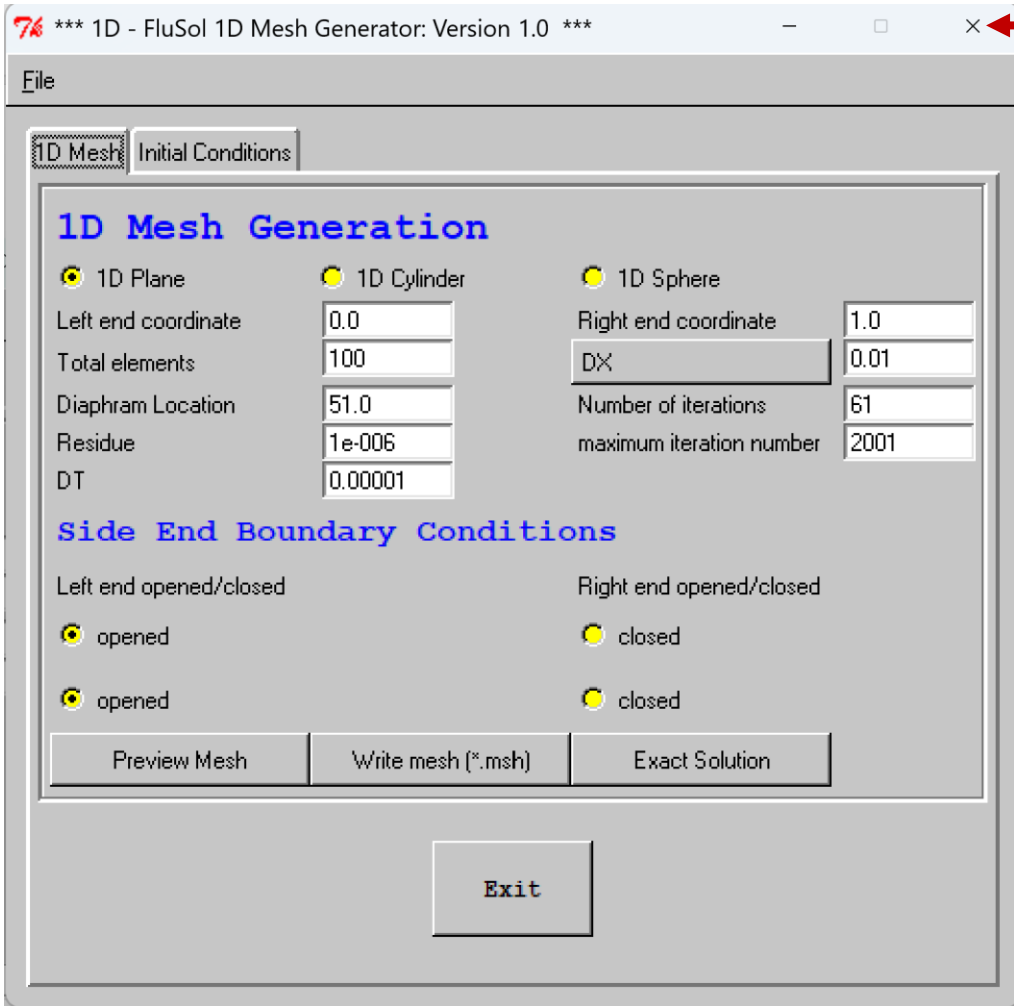
```
***begin
solver = mesh
dimension = 1D
adapt = off
viscosity = off
file = a1
*title
Sod's shock tube problem
*mesh
set = 1
type = one
elex = 100
xleft = 0.000
xright = 1.000
far = 1
far = 2
end
*initial conditions
1,101,1 , 1.0, 1.0,0.0,0.0,100000.0
52,101,1 , 0.125, 1.0,0.0,0.0,10000.0
*last card
```

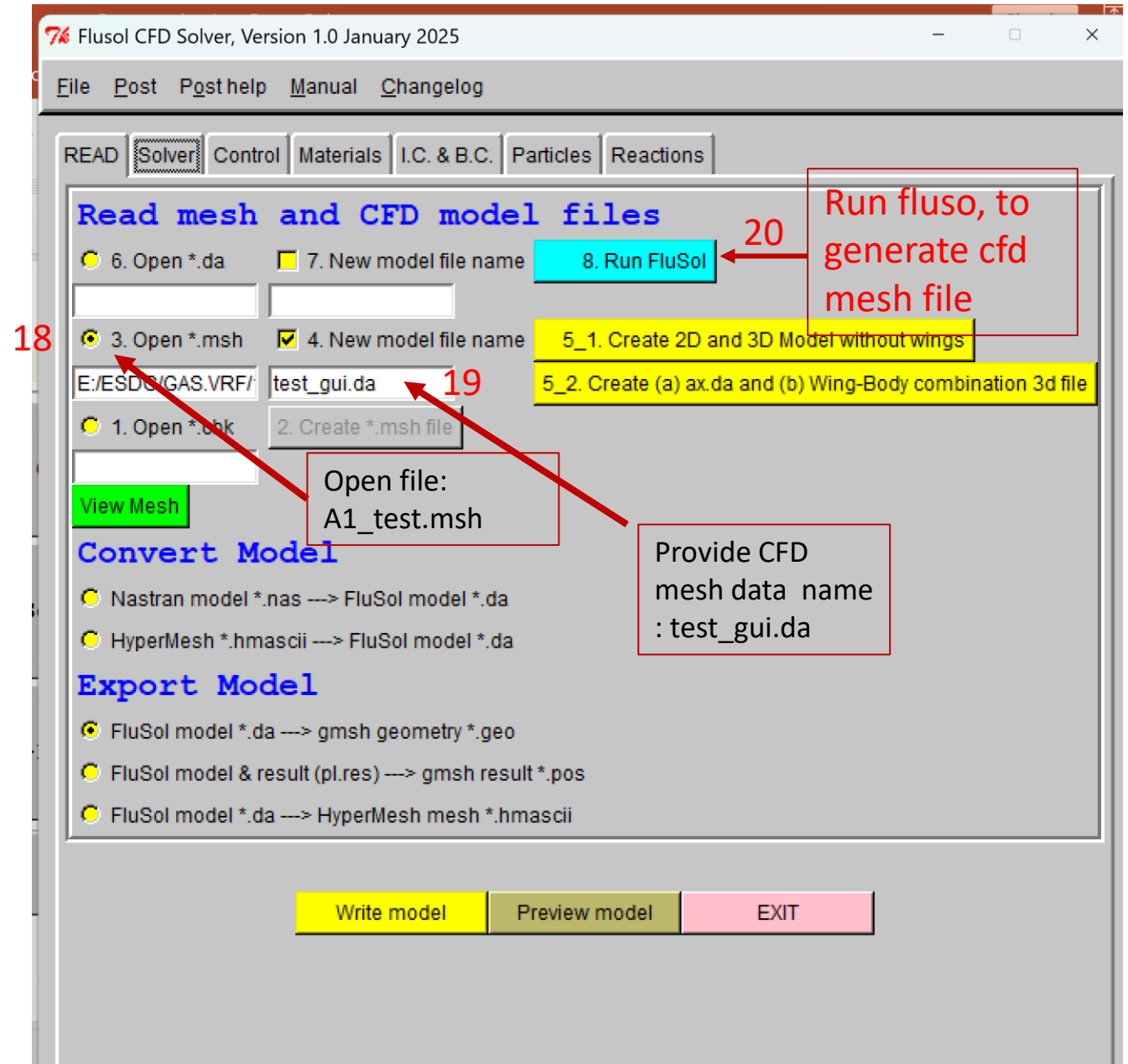
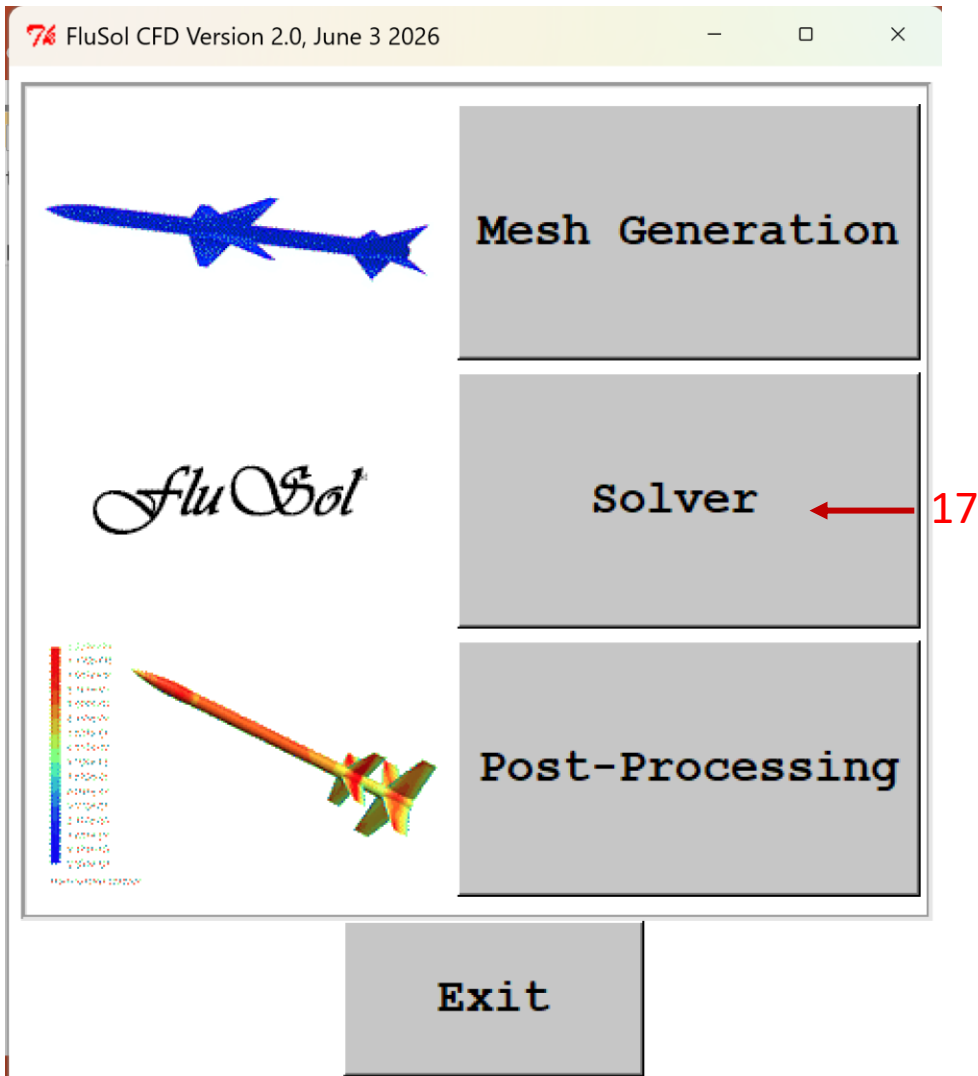
14

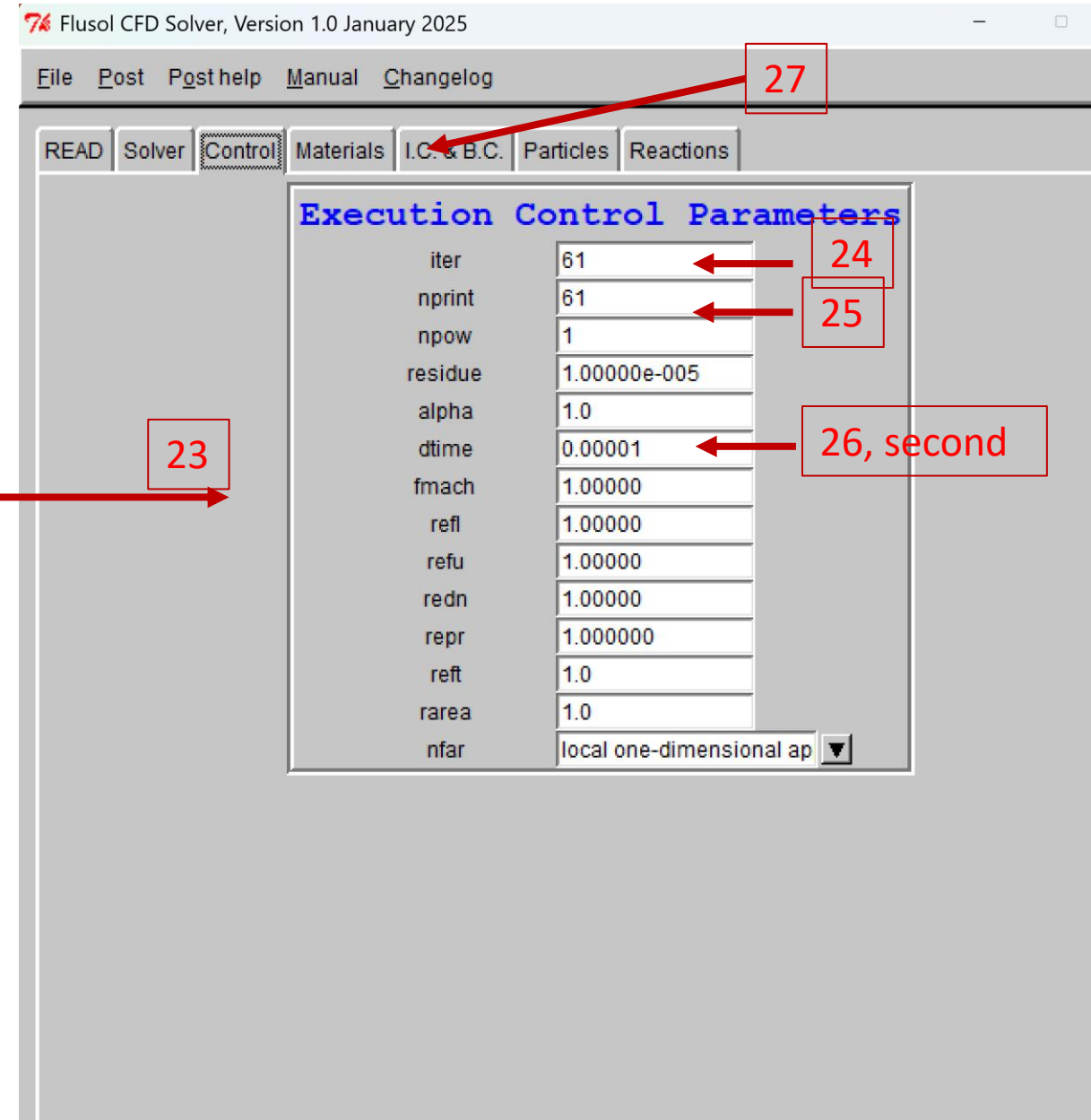
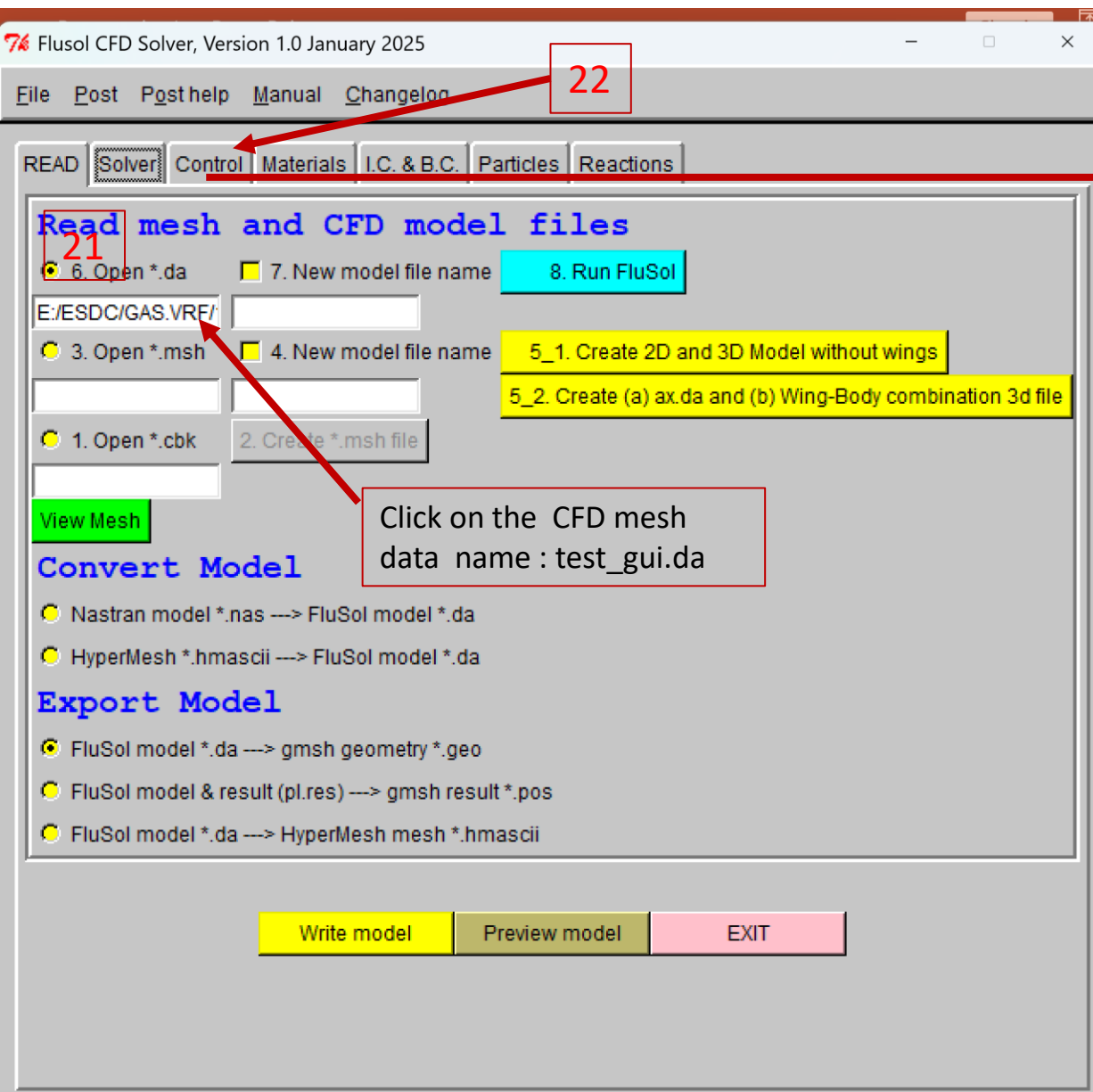


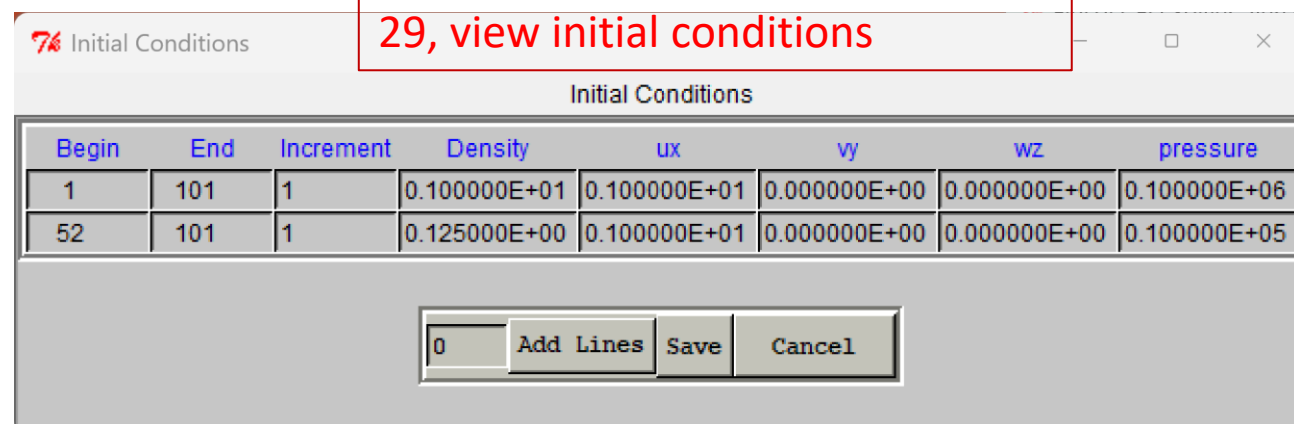
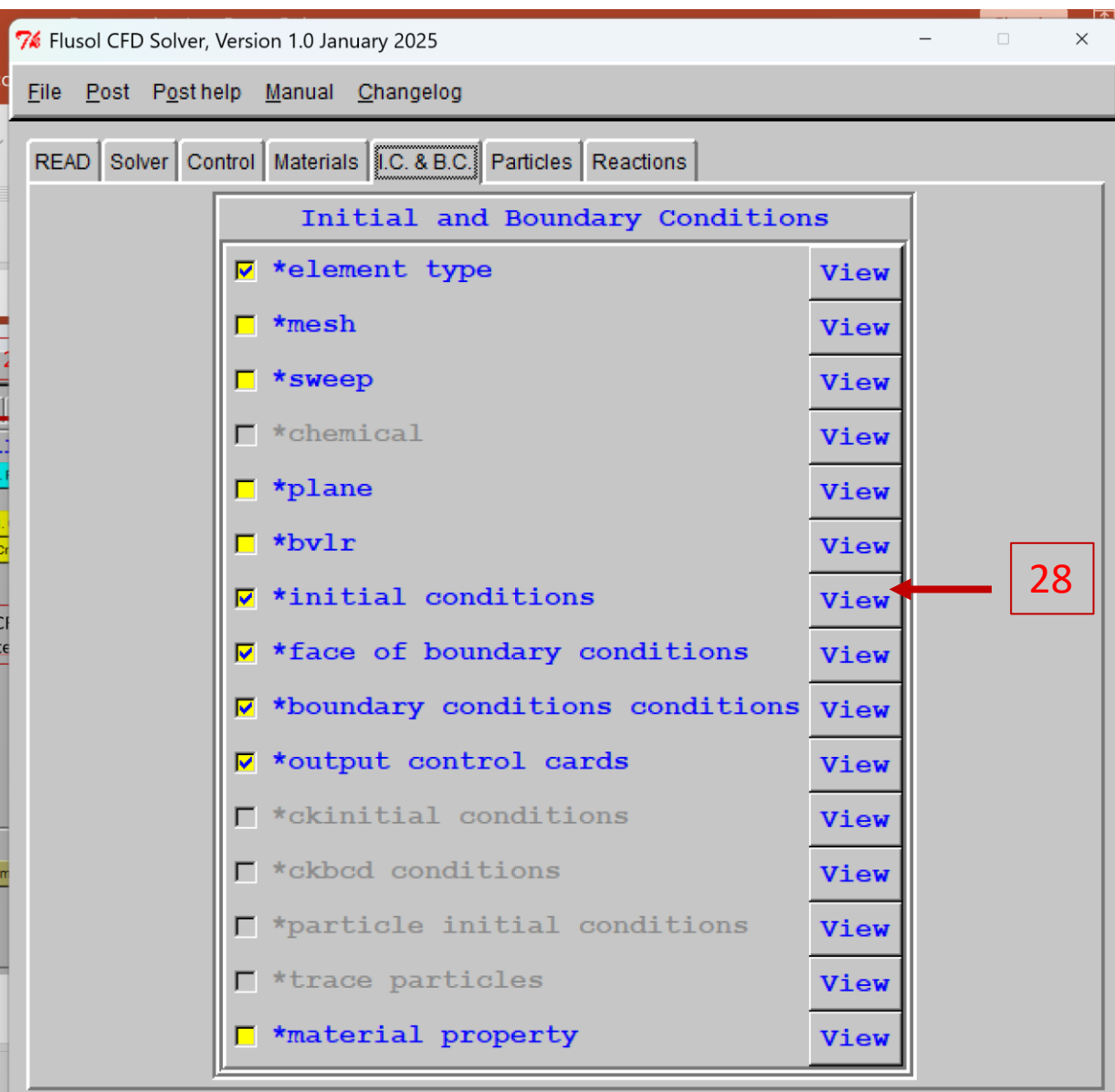
1. Save mesh generation file as A1_test.msh
2. Later to run flusol solver to create CFD mesh file

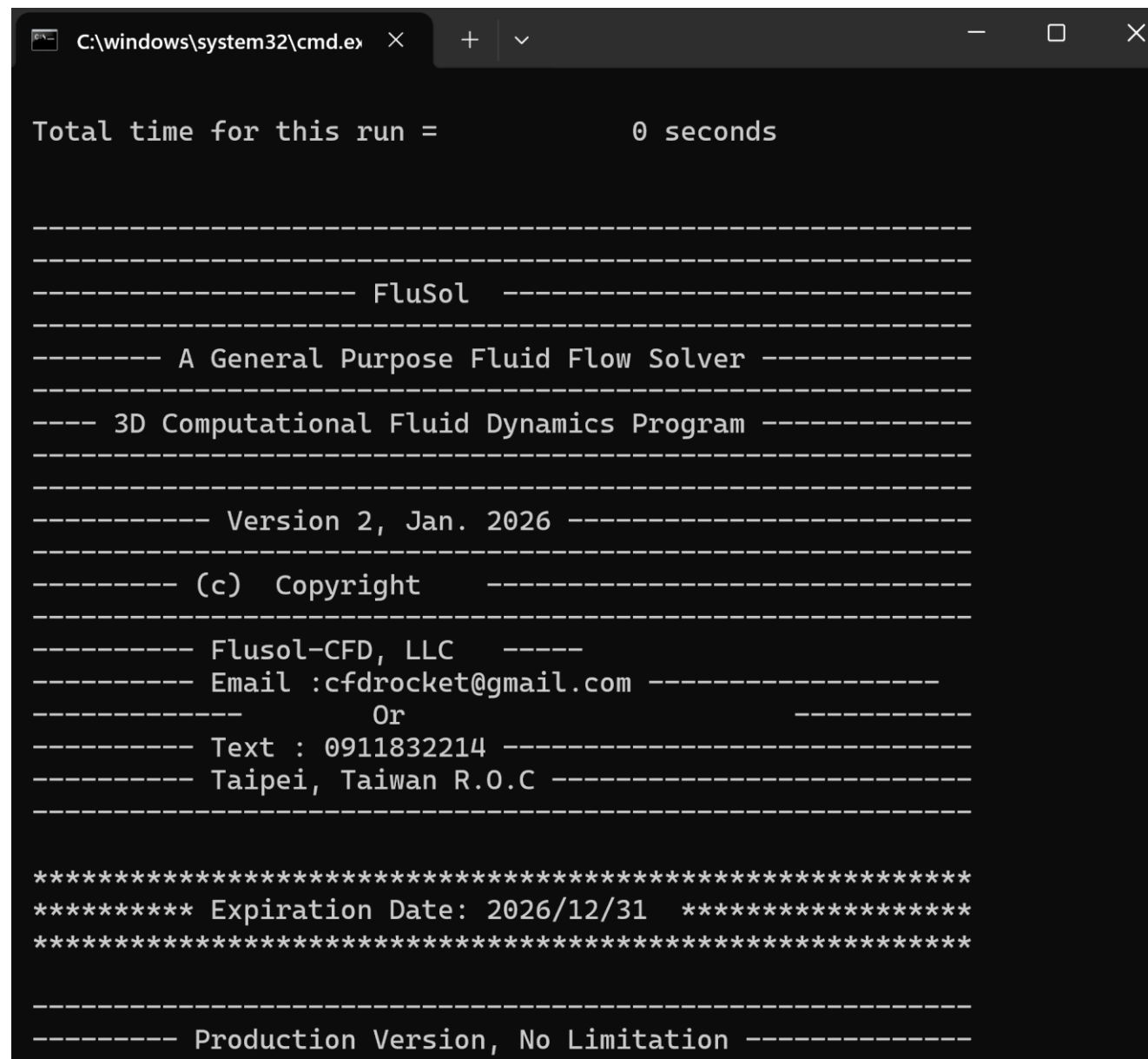
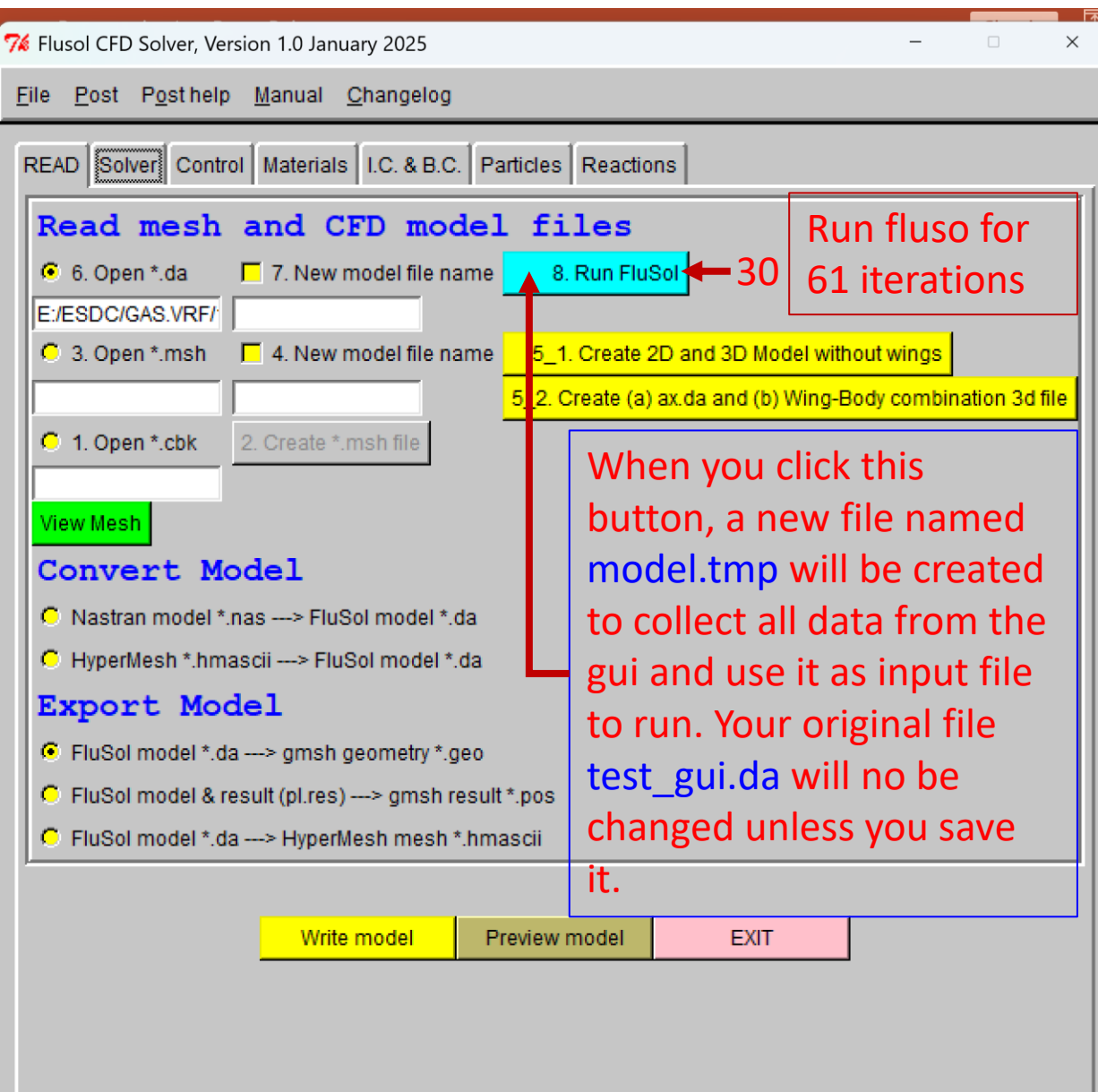
Closed both pages

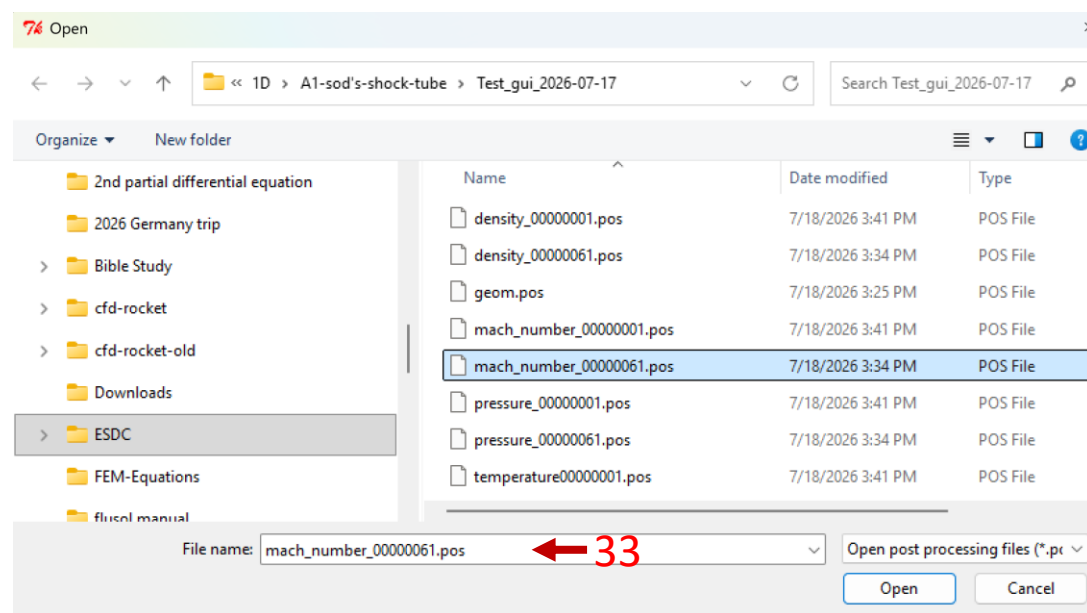
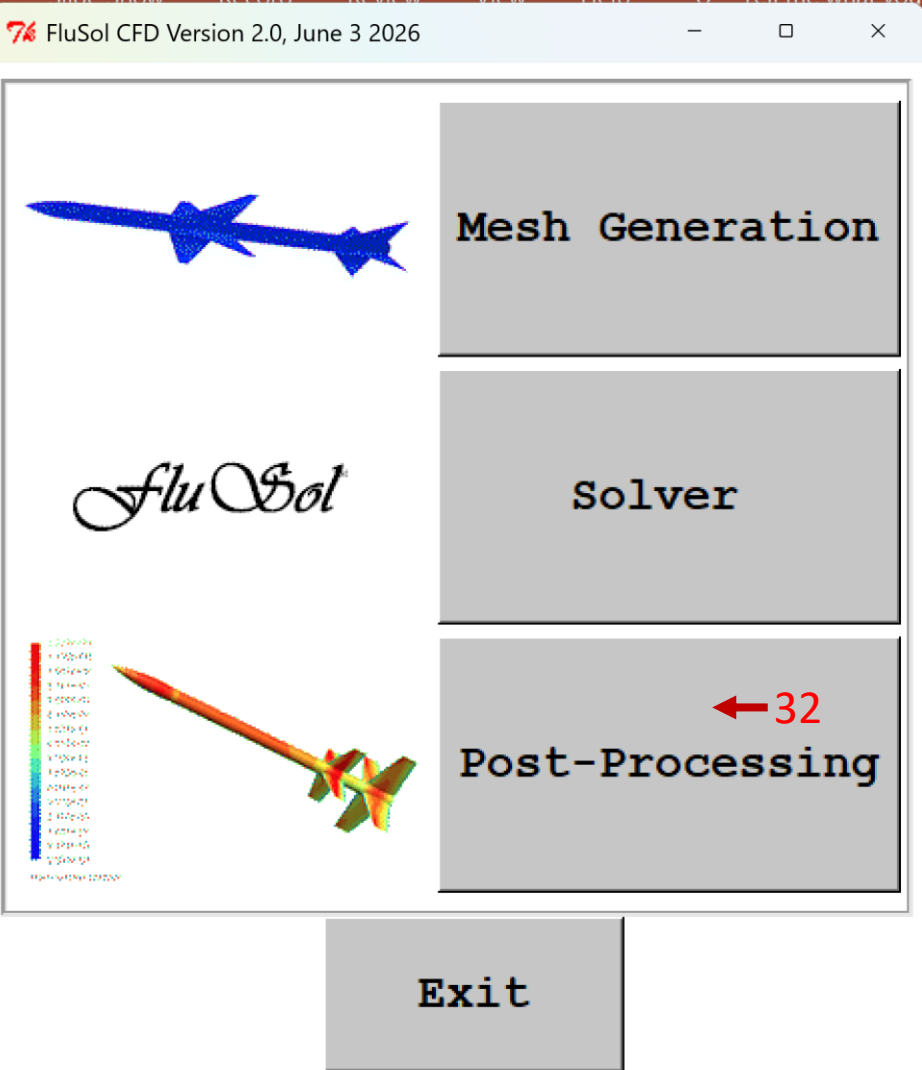


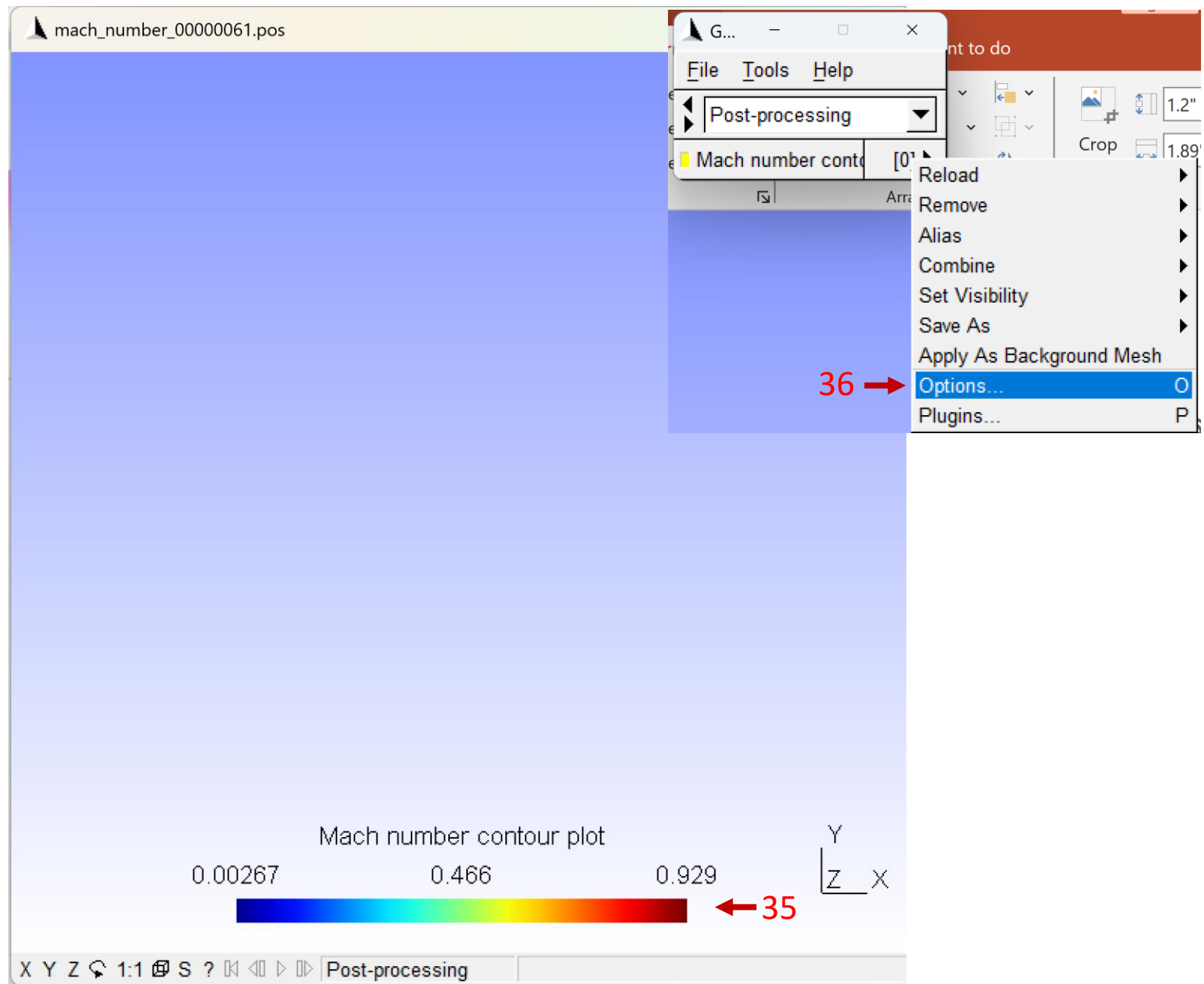
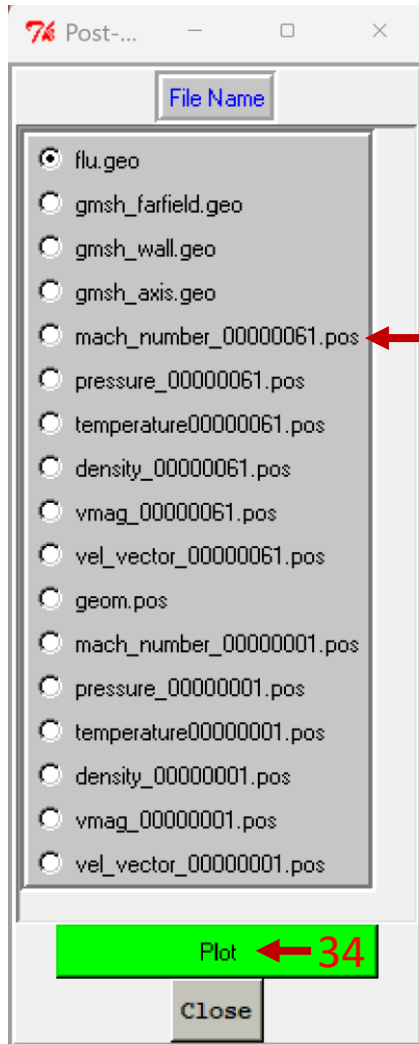


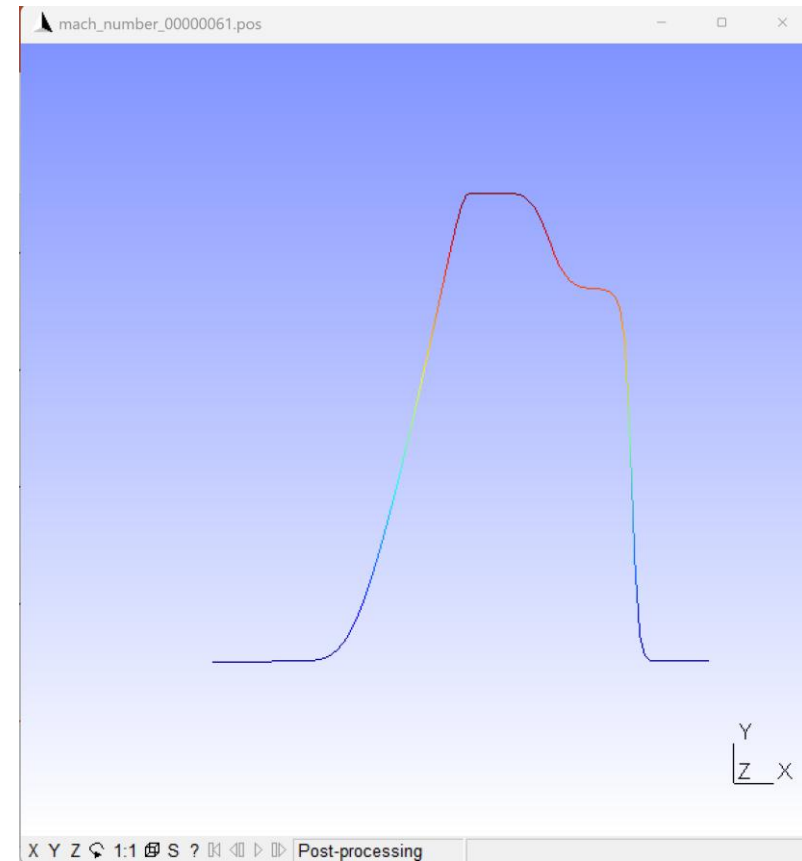
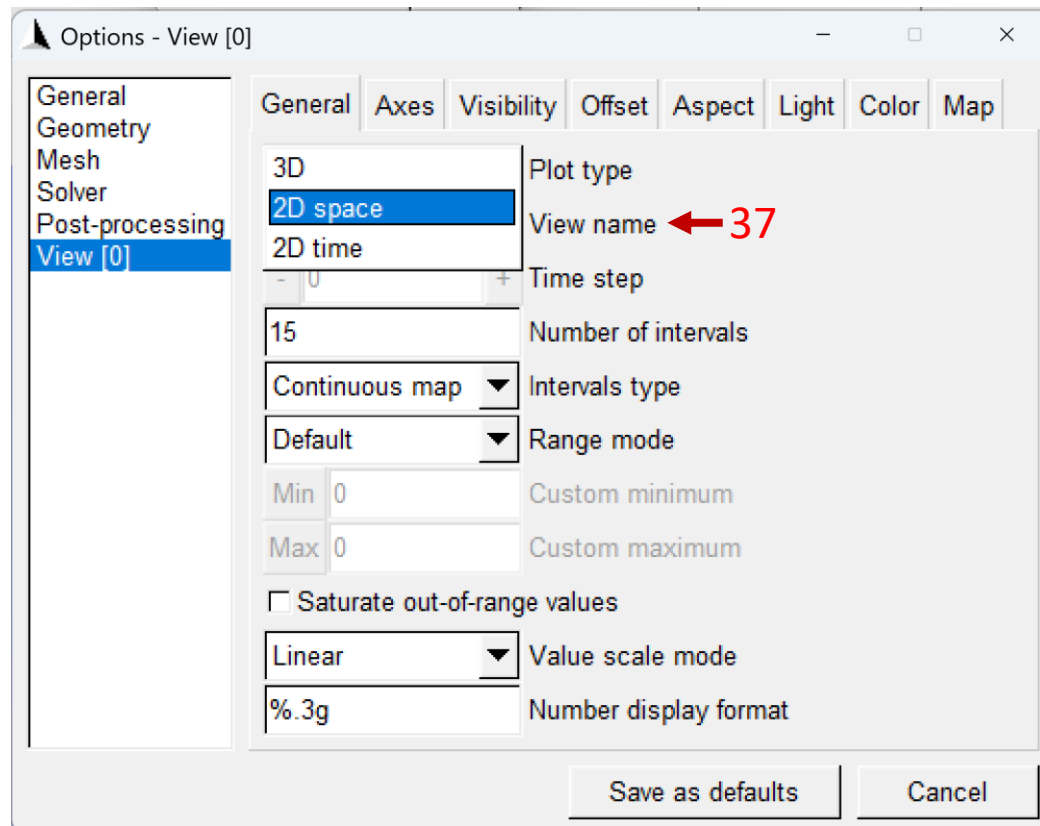












38

