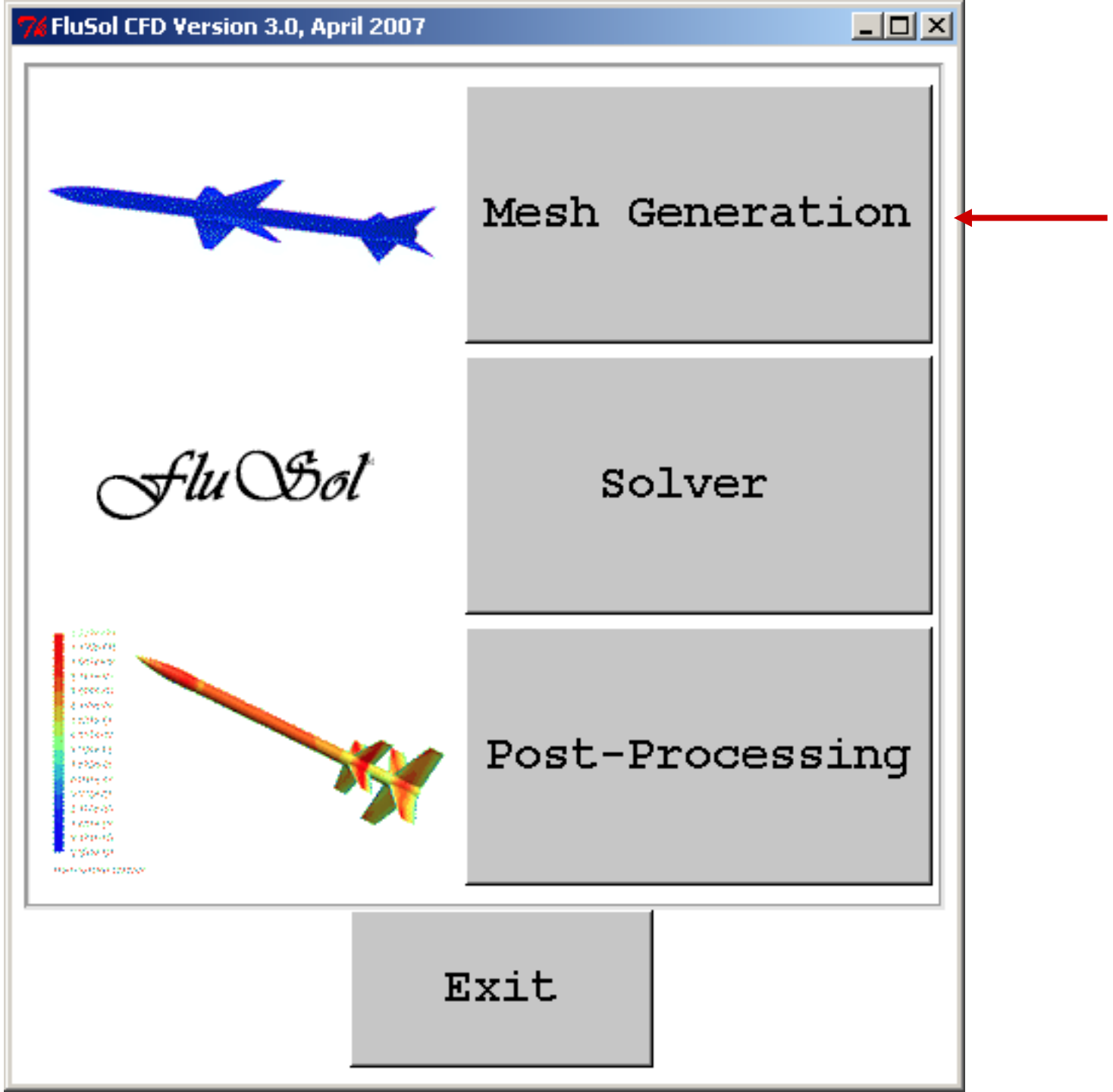
F8 Mesh Generation Process and Post Processing

Version 1

April 2025

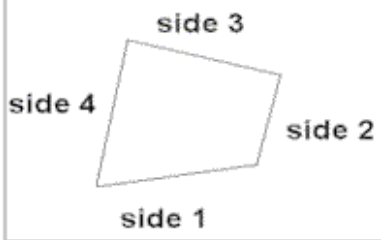

FluSol CFD Version 3.0, April 2007
Mesh Generation
FluSol
Solver
Post-Processing
Exit

FluSol MESH

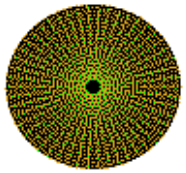
1D Mesh Generation

1D

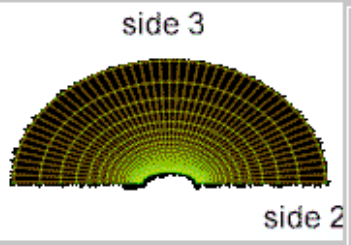
2D & 3D Mesh



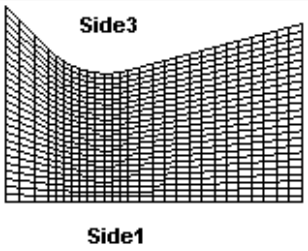
Patch



Circle



Ellipse



Duct

Exit

*** Patch - FluSol Patch Mesh Generator: Versio...

File

Patch | Initial & Boundary conditions

Patch Mesh Generation

View mesh | Assembly blocks

Region Number: 1 | Write Mesh | Preview file | Close

Part name: 1_nose and incoming flow

Reset Variables:

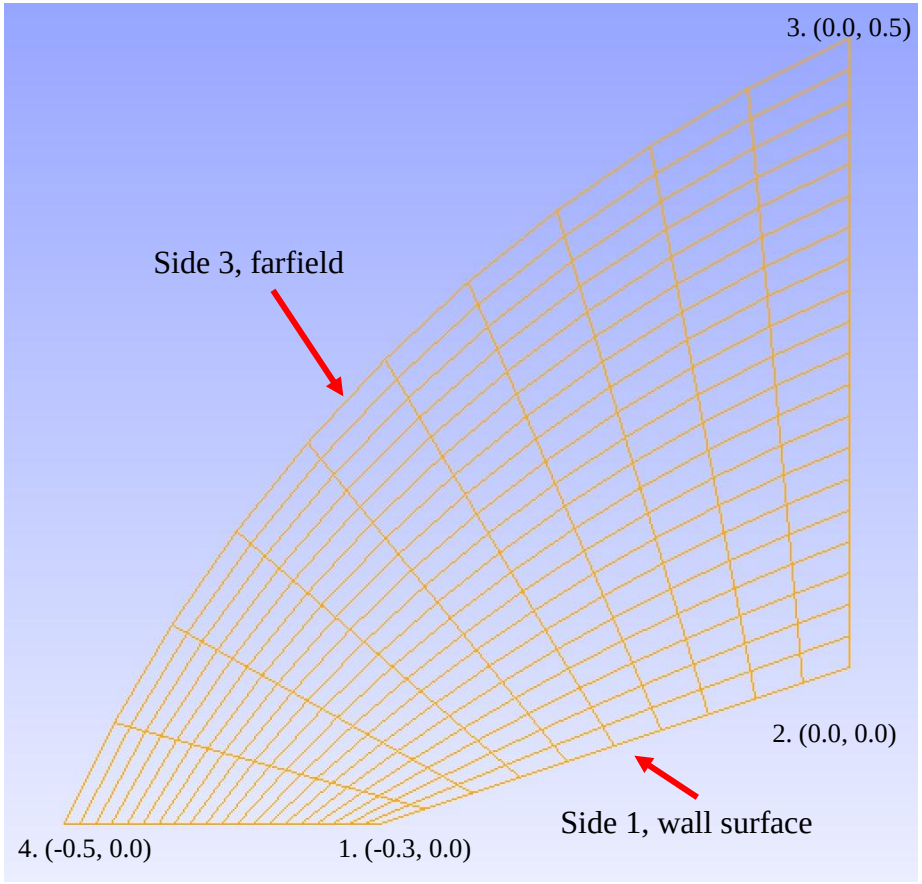
Upper Curve (Side 3)		Lower Curve (Side 1)	
ityu	1 Circular arc	ityb	0 Straight line
slopu (line)	1.0	slopb (line)	0.0
radius (slopu)	1.0	radius (slopb)	0.0
Parabolic power (slopu):	1.0	Parabolic power (slopb):	0.0
X-Axis length (axu):	0.0	X-Axis length (axb):	0.0
Y-Axis length (ayu):	0.0	Y-Axis length (ayb):	0.0
strux	0	strlx	0
dxumin	0.1	dxlmin	0.1
residue	0.0001	stretch	0
factor	0.0	dymin:	0.0
Create wings		number of wings:	4
Cross section:	1 circular arc,	thick	0.05
wing location:	0	Total sweeping elements	60
NACA XXXX	0012		
Upper wing profile			
lower wing profile			

Node coordinates

node: quad 4

elex: 10 | eley: 20

Node 1	X1:	-0.3	Y1:	0.0
Node 2	X2:	0.0	Y2:	0.1
Node 3	X3:	0.0	Y3:	0.5
Node 4	X4:	-0.5	Y4:	0.0



*** Patch - FluSol Patch Mesh Generator: Versio...

File

Patch | Initial & Boundary conditions

Patch Mesh Generation

View mesh | Assembly blocks

Region Number: 2 | Write Mesh | Preview file | Close

Part name: 2_cylinder

Reset Variables:

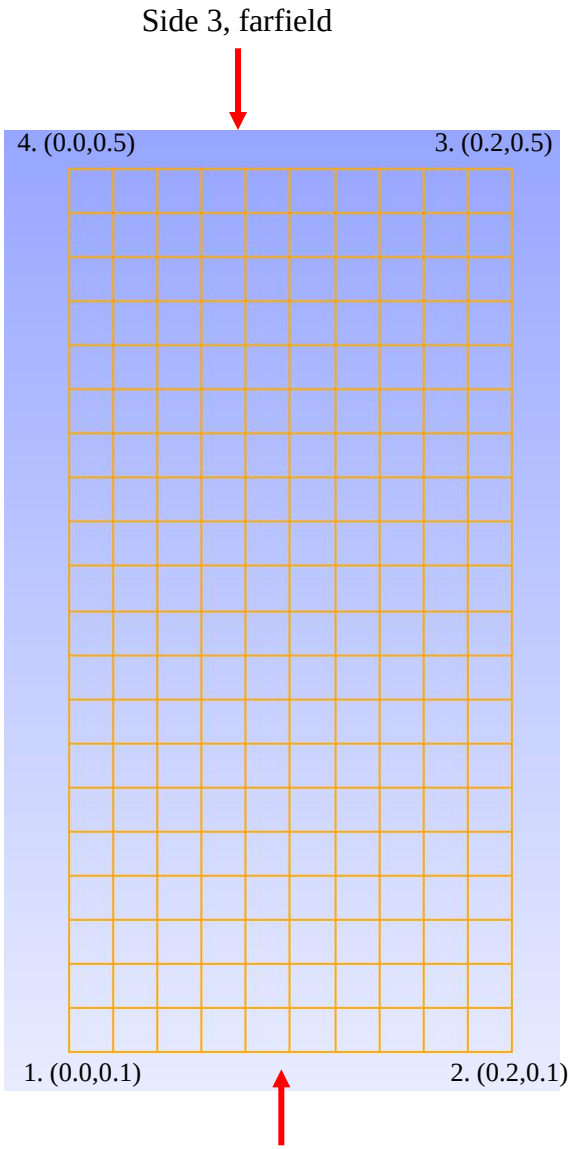
Upper Curve (Side 3)		Lower Curve (Side 1)	
ityu	0 Straight line	ityb	0 Straight line
slopu (line)	1.0	slopb (line)	0.0
radius (slopu)	1.0	radius (slopb)	0.0
Parabolic power (slopu):	1.0	Parabolic power (slopb):	0.0
X-Axis length (axu):	0.0	X-Axis length (axb):	0.0
Y-Axis length (ayu):	0.0	Y-Axis length (ayb):	0.0
strux	0	strlx	0
dxumin	0.1	dxlmin	0.1
residue	0.0001	stretch	0
factor	0.0	dymin:	0.0
Create wings		number of wings:	4
Cross section:	1 circular arc,	thick	0.05
wing location:	0	Total sweeping elements	60
NACA XXXX	None		
Upper wing profile			
lower wing profile			

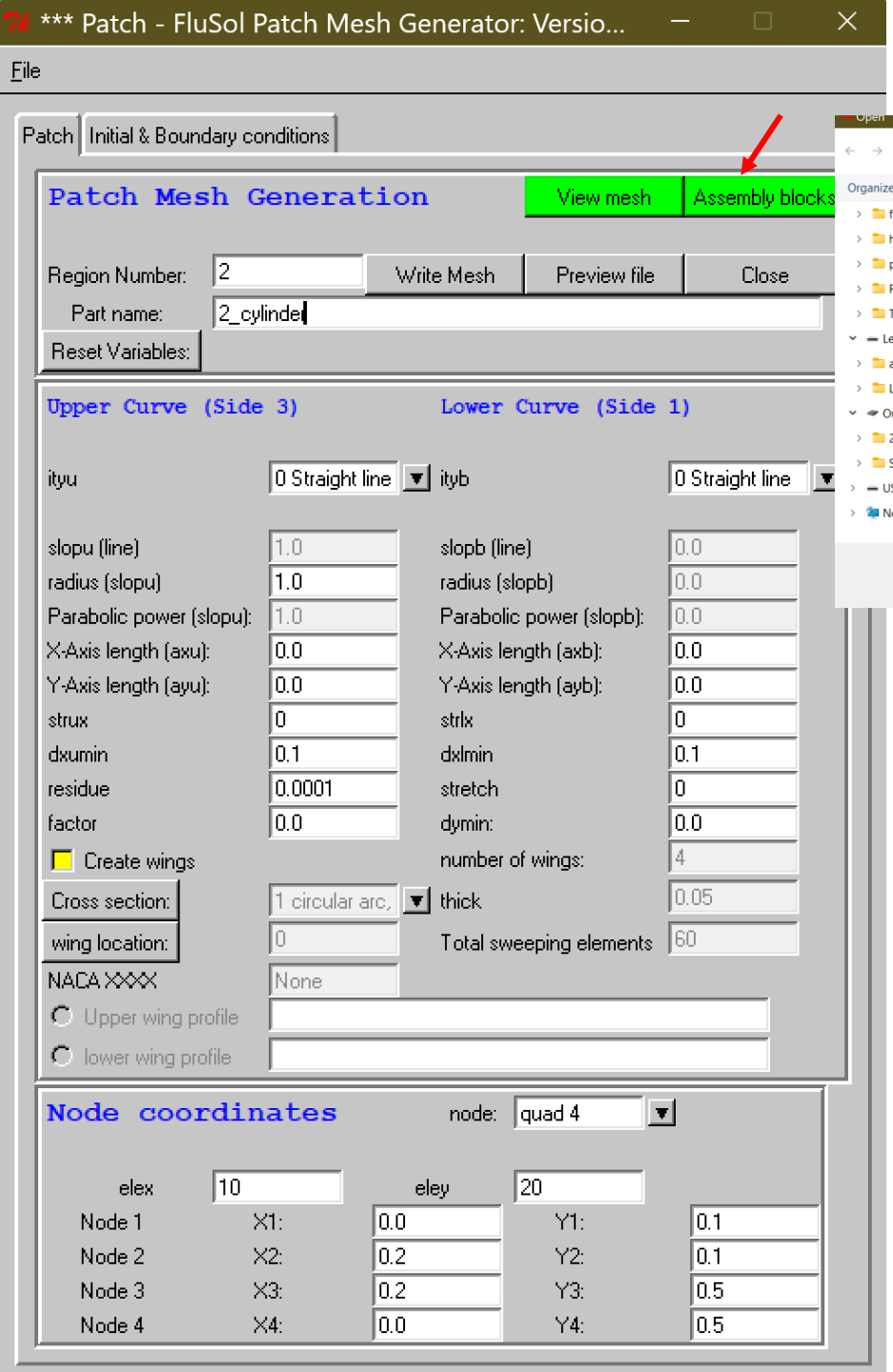
Node coordinates

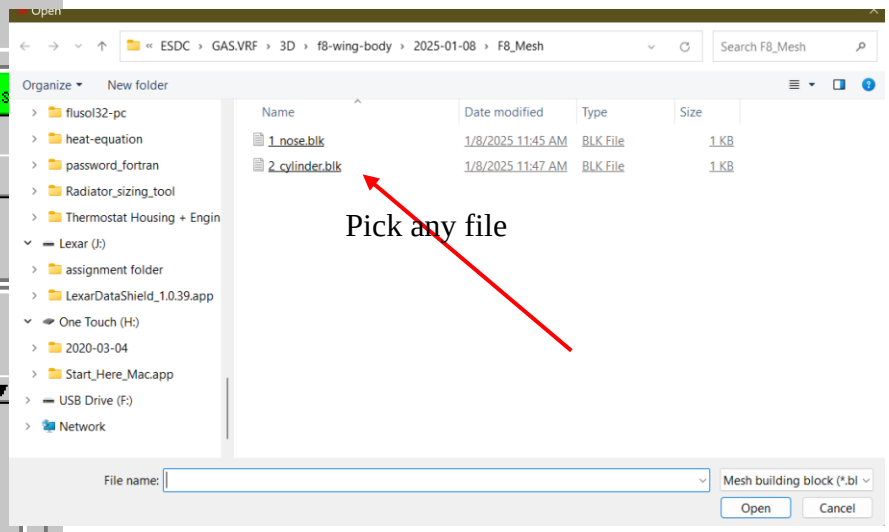
node: quad 4

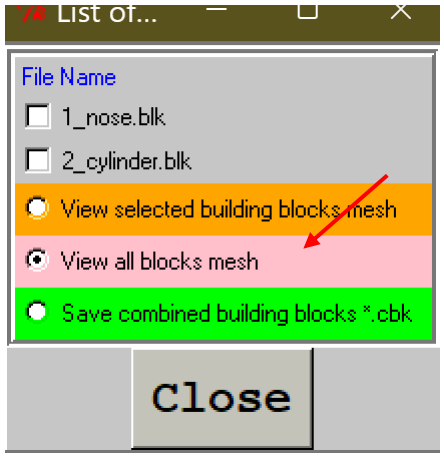
elex: 10 | eley: 20

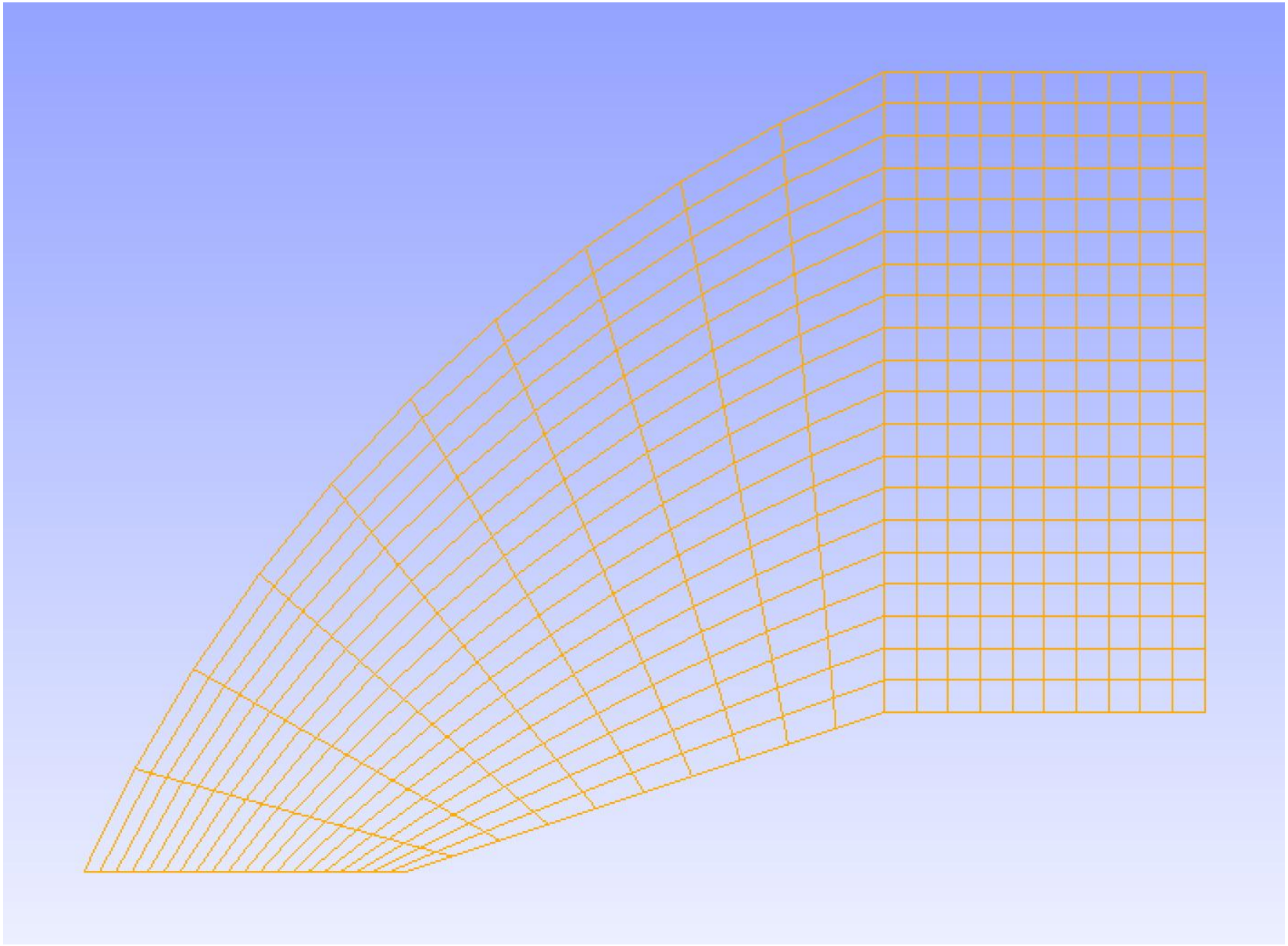
Node 1	X1:	0.0	Y1:	0.1
Node 2	X2:	0.2	Y2:	0.1
Node 3	X3:	0.2	Y3:	0.5
Node 4	X4:	0.0	Y4:	0.5




*** Patch - FluSol Patch Mesh Generator: Versio...
File
Patch
Initial & Boundary conditions
Patch Mesh Generation
View mesh
Assembly blocks
Region Number:
2
Write Mesh
Preview file
Close
Part name:
2_cylinder
Reset Variables:
Upper Curve (Side 3)
Lower Curve (Side 1)
ityu
0 Straight line
ityb
0 Straight line
slopu (line)
1.0
slopb (line)
0.0
radius (slopu)
1.0
radius (slopb)
0.0
Parabolic power (slopu):
1.0
Parabolic power (slopb):
0.0
X-Axis length (axu):
0.0
X-Axis length (axb):
0.0
Y-Axis length (ayu):
0.0
Y-Axis length (ayb):
0.0
strux
0
strlx
0
dxumin
0.1
dxlmin
0.1
residue
0.0001
stretch
0
factor
0.0
dymin:
0.0
Create wings
number of wings:
4
Cross section:
1 circular arc,
thick
0.05
wing location:
0
Total sweeping elements
60
NACA XXXX
None
Upper wing profile
lower wing profile
Node coordinates
node:
quad 4
elex
10
eley
20
Node 1
X1:
0.0
Y1:
0.1
Node 2
X2:
0.2
Y2:
0.1
Node 3
X3:
0.2
Y3:
0.5
Node 4
X4:
0.0
Y4:
0.5


Open
ESDC › GAS.VRF › 3D › f8-wing-body › 2025-01-08 › F8_Mesh
Search F8_Mesh
Organize
New folder
flusol32-pc
heat-equation
password_fortran
Radiator_sizing_tool
Thermostat Housing + Engin
Lexar (J:)
assignment folder
LexarDataShield_1.0.39.app
One Touch (H:)
2020-03-04
Start_Here_Mac.app
USB Drive (F:)
Network
Name
Date modified
Type
Size
1_nose.blk
1/8/2025 11:45 AM
BLK File
1 KB
2_cylinder.blk
1/8/2025 11:47 AM
BLK File
1 KB
Pick any file
File name:
Mesh building block (*.bl
Open
Cancel


List of...
File Name
1_nose.blk
2_cylinder.blk
View selected building blocks mesh
View all blocks mesh
Save combined building blocks *.cbk
Close



*** Patch - FluSol Patch Mesh Generator: Versio...

File

Patch | Initial & Boundary conditions

Patch Mesh Generation

View mesh | Assembly blocks

Region Number: 3 | Write Mesh | Preview file | Close

Part name:

Reset Variables:

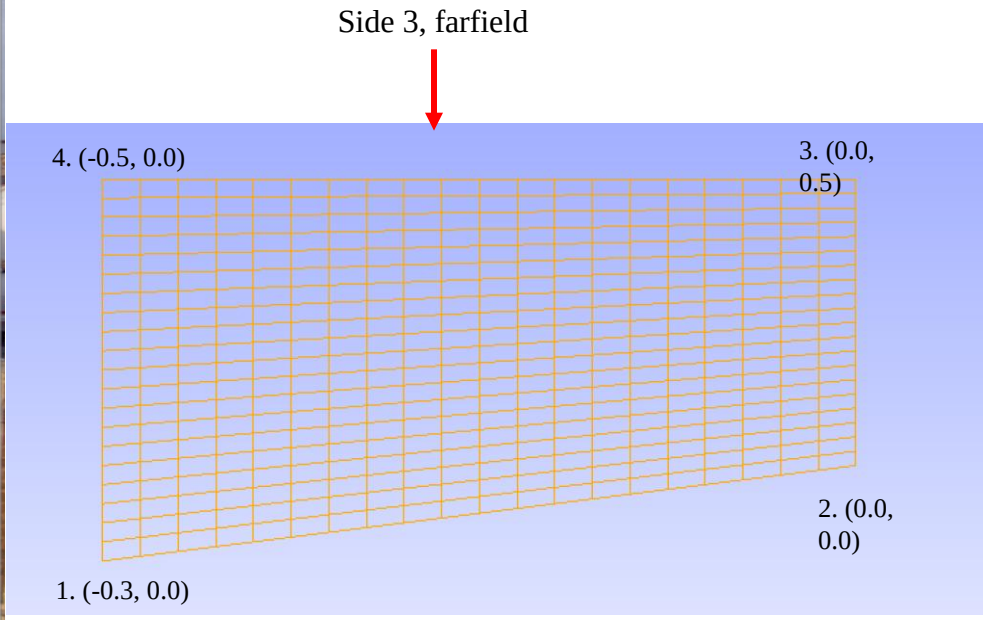
Upper Curve (Side 3)		Lower Curve (Side 1)	
ityu	0 Straight line	ityb	0 Straight line
slopu (line)	1.0	slopb (line)	0.0
radius (slopu)	1.0	radius (slopb)	0.0
Parabolic power (slopu):	1.0	Parabolic power (slopb):	0.0
X-Axis length (axu):	0.0	X-Axis length (axb):	0.0
Y-Axis length (ayu):	0.0	Y-Axis length (ayb):	0.0
strux	0	strlx	0
dxumin	0.1	dxlmin	0.1
residue	0.0001	stretch	0
factor	0.0	dymin:	0.0
Create wings		number of wings:	4
Cross section:	1 circular arc,	thick	0.05
wing location:	0	Total sweeping elements	60
NACA XXXX	None		
Upper wing profile			
lower wing profile			

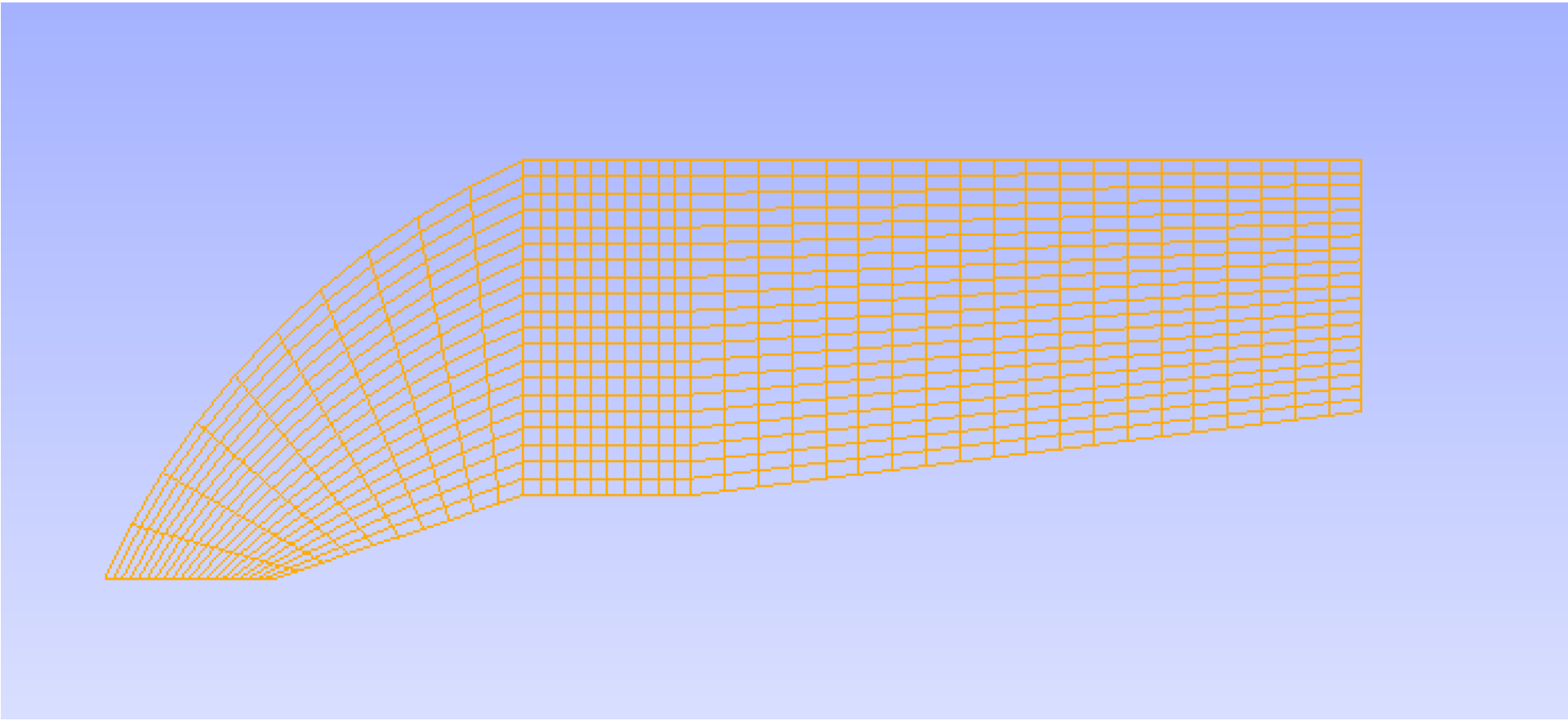
Node coordinates

node: quad 4

elex: 20 | eley: 20

Node 1	X1:	0.2	Y1:	0.1
Node 2	X2:	1.0	Y2:	0.2
Node 3	X3:	1.0	Y3:	0.5
Node 4	X4:	0.2	Y4:	0.5





*** Patch - FluSol Patch Mesh Generator: Versio...

File

Patch | Initial & Boundary conditions

Patch Mesh Generation

View mesh | Assembly blocks

Region Number: 4 | Write Mesh | Preview file | Close

Part name:

Reset Variables:

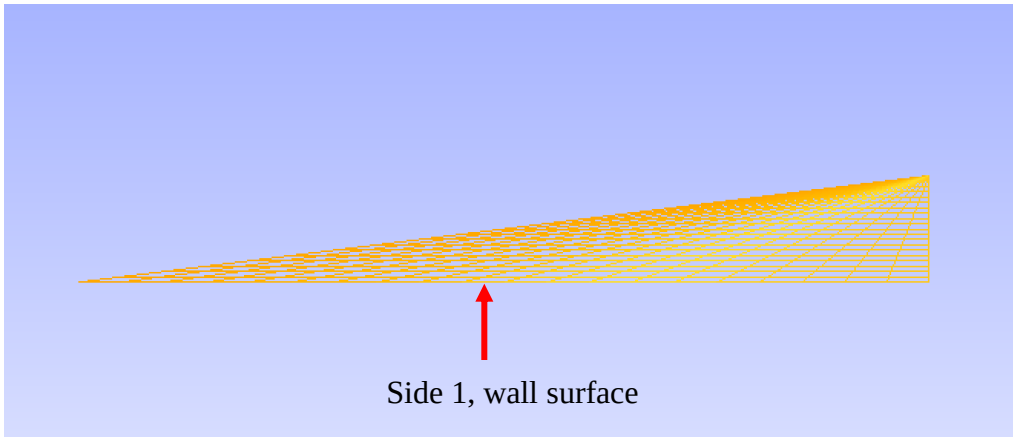
Upper Curve (Side 3)		Lower Curve (Side 1)	
ityu	0 Straight line	ityb	0 Straight line
slopu (line)	1.0	slopb (line)	0.0
radius (slopu)	1.0	radius (slopb)	0.0
Parabolic power (slopu):	1.0	Parabolic power (slopb):	0.0
X-Axis length (axu):	0.0	X-Axis length (axb):	0.0
Y-Axis length (ayu):	0.0	Y-Axis length (ayb):	0.0
strux	0	strlx	0
dxumin	0.1	dxlmin	0.1
residue	0.0001	stretch	0
factor	0.0	dymin:	0.0
Create wings		number of wings:	2
Cross section:	1 circular arc,	thick	0.05
wing location:	0	Total sweeping elements	60
NACA XXXX	None		
Upper wing profile			
lower wing profile			

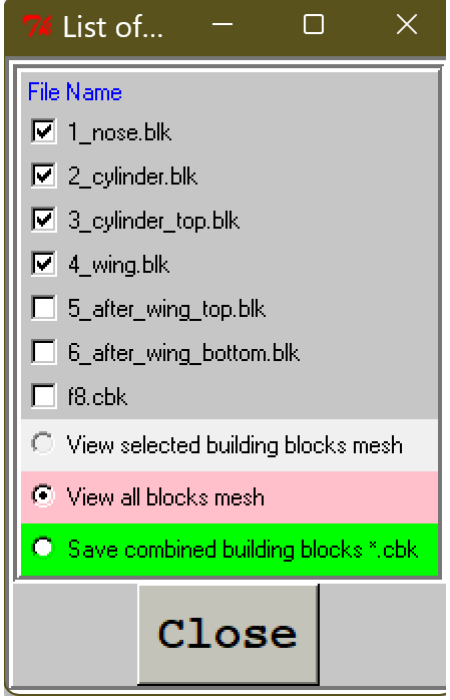
Node coordinates

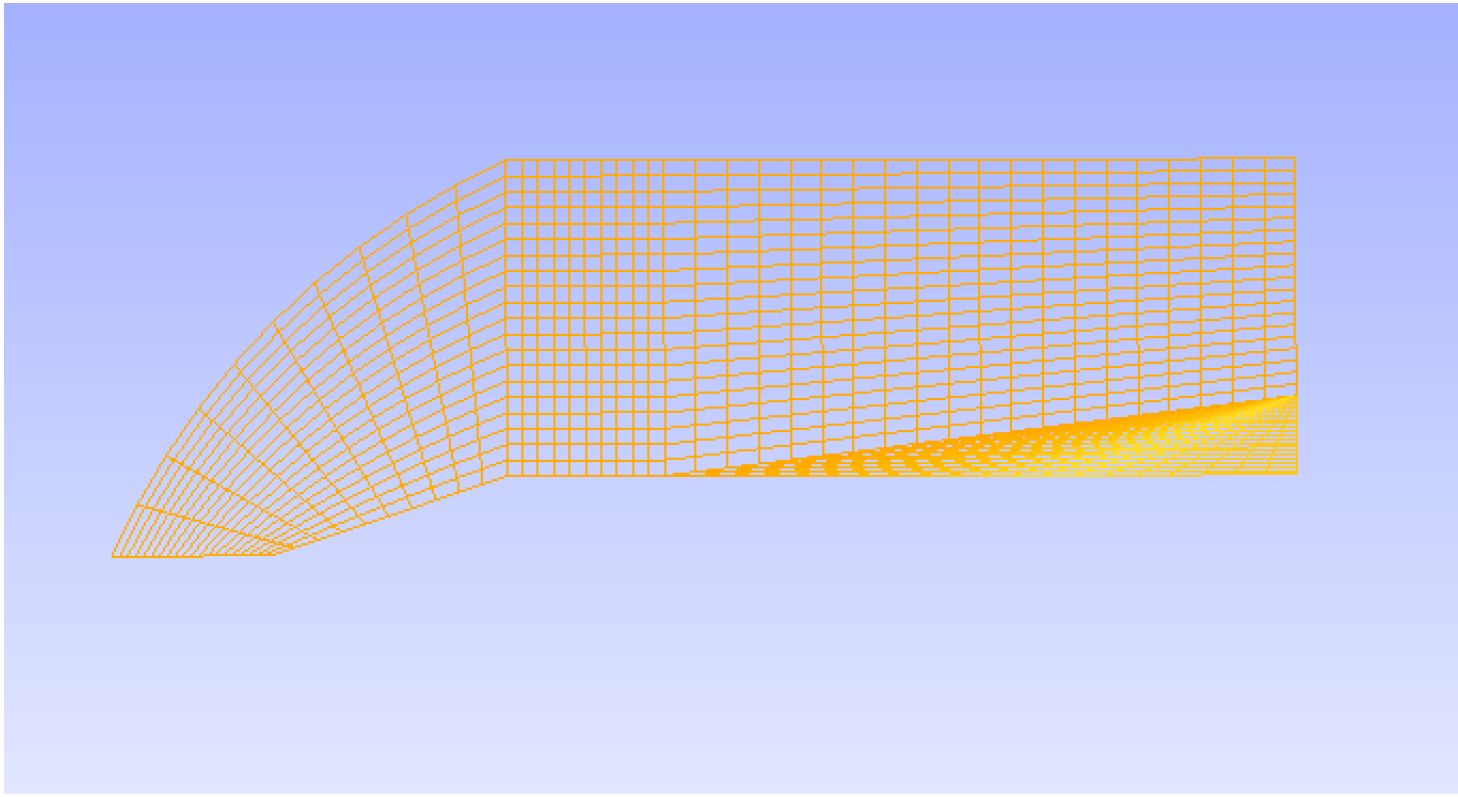
node: quad 4

elex: 20 | eley: 20

Node 1	X1:	0.2	Y1:	0.1
Node 2	X2:	1.0	Y2:	0.1
Node 3	X3:	1.0	Y3:	0.2
Node 4	X4:	1.0	Y4:	0.2




List of...
File Name
1_nose.blk
2_cylinder.blk
3_cylinder_top.blk
4_wing.blk
5_after_wing_top.blk
6_after_wing_bottom.blk
f8.cbk
View selected building blocks mesh
View all blocks mesh
Save combined building blocks *.cbk
Close



*** Patch - FluSol Patch Mesh Generator: Versio...

File

Patch | Initial & Boundary conditions

Patch Mesh Generation

View mesh | Assembly blocks

Region Number: 5 | Write Mesh | Preview file | Close

Part name:

Reset Variables:

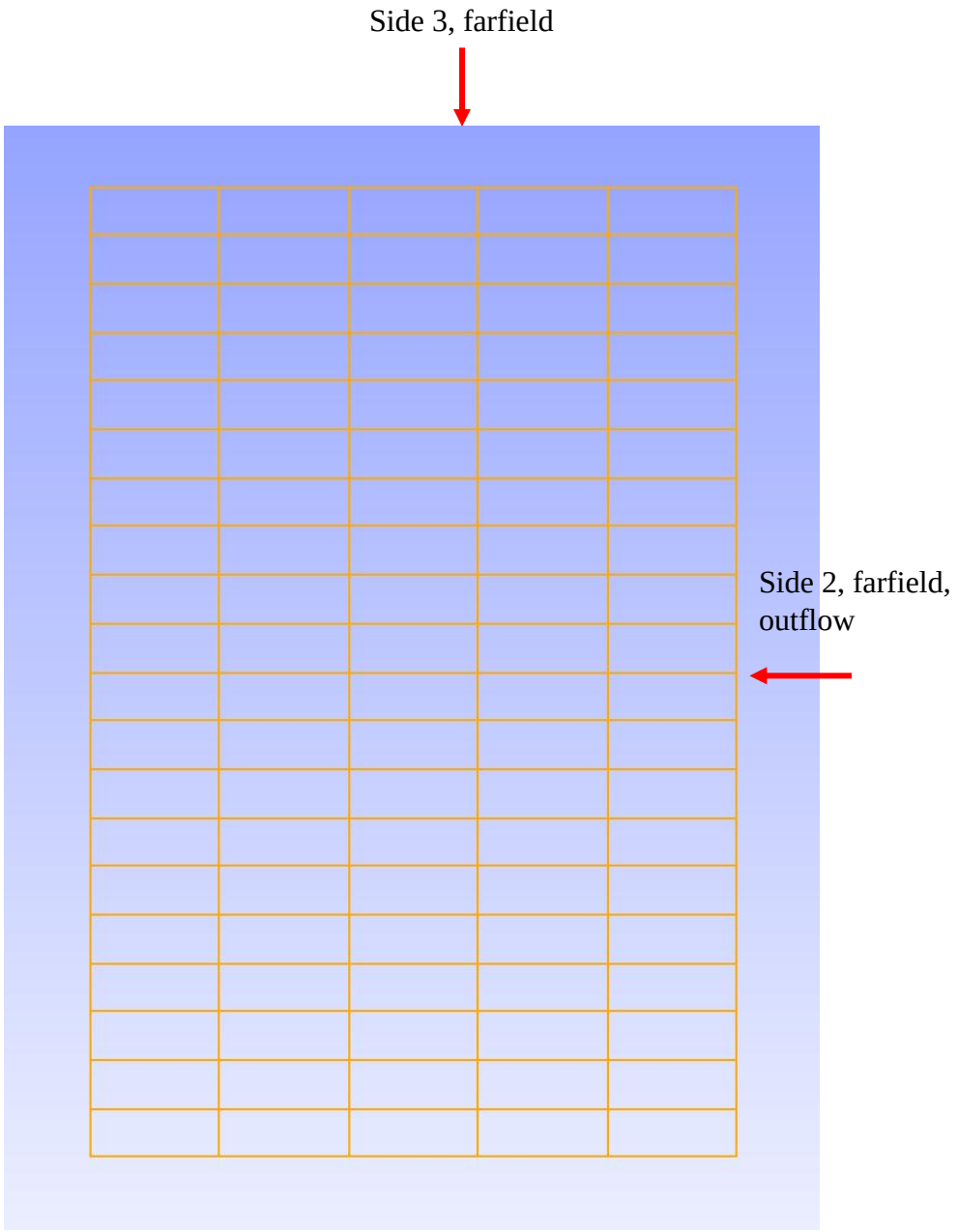
Upper Curve (Side 3)		Lower Curve (Side 1)	
ityu	0 Straight line	ityb	0 Straight line
slopu (line)	1.0	slopb (line)	0.0
radius (slopu)	1.0	radius (slopb)	0.0
Parabolic power (slopu):	1.0	Parabolic power (slopb):	0.0
X-Axis length (axu):	0.0	X-Axis length (axb):	0.0
Y-Axis length (ayu):	0.0	Y-Axis length (ayb):	0.0
strux	0	strlx	0
dxumin	0.1	dxlmin	0.1
residue	0.0001	stretch	0
factor	0.0	dymin:	0.0
Create wings		number of wings:	2
Cross section:	1 circular arc,	thick	0.05
wing location:	0	Total sweeping elements	60
NACA XXXX	None		
Upper wing profile			
lower wing profile			

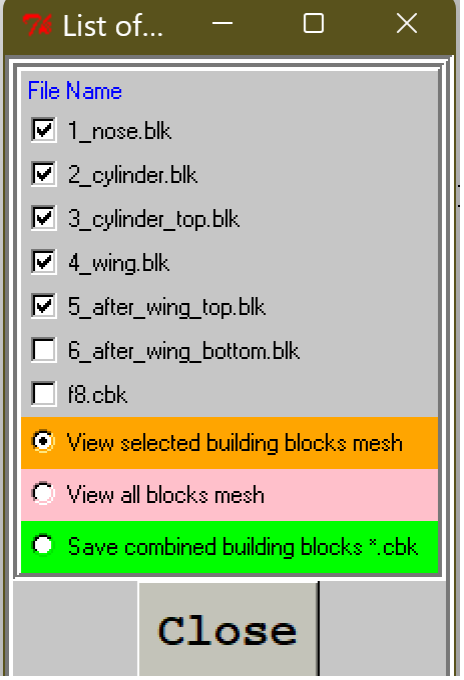
Node coordinates

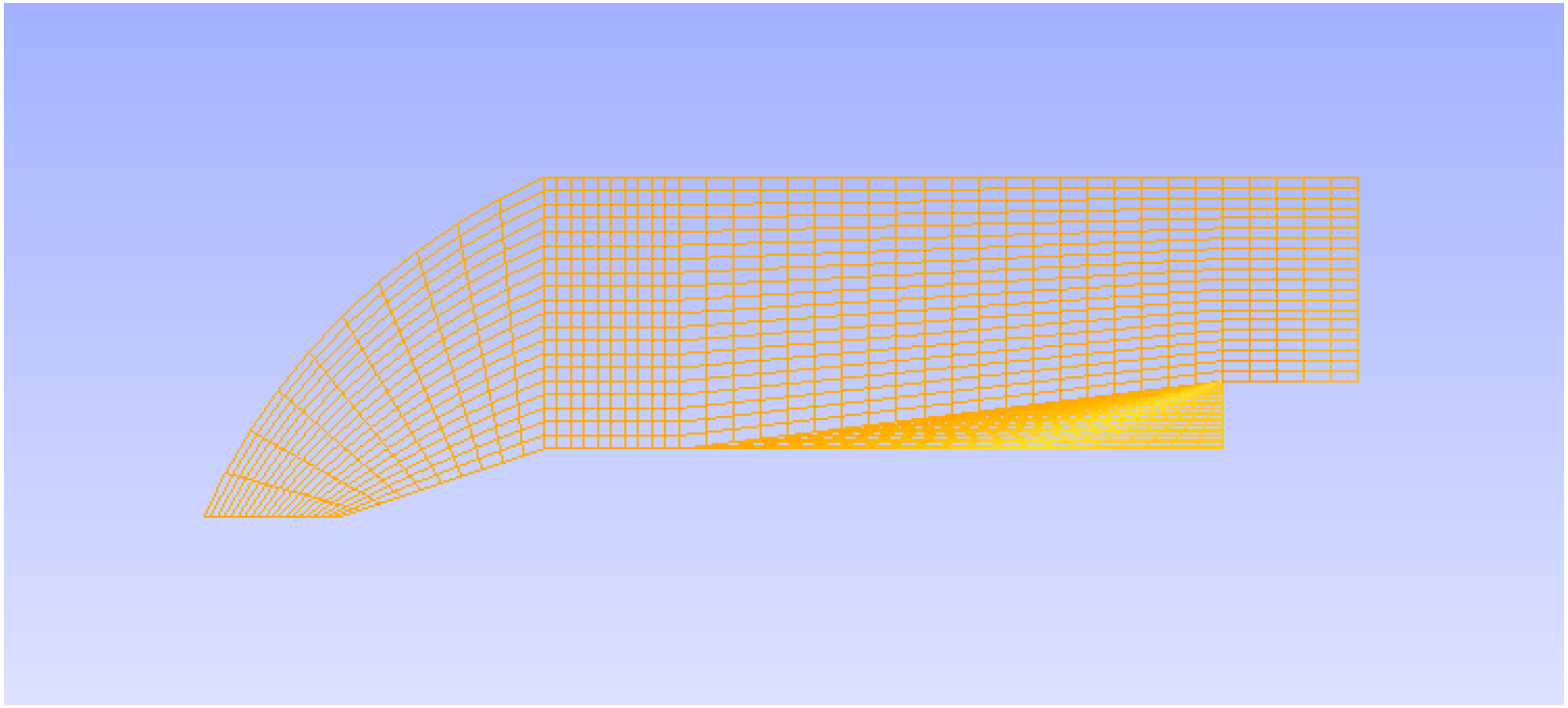
node: quad 4

elex 5 | eley 20

Node 1	X1:	1.0	Y1:	0.2
Node 2	X2:	1.2	Y2:	0.2
Node 3	X3:	1.2	Y3:	0.5
Node 4	X4:	1.0	Y4:	0.5




List of...
File Name
1_nose.blk
2_cylinder.blk
3_cylinder_top.blk
4_wing.blk
5_after_wing_top.blk
6_after_wing_bottom.blk
f8.cbk
View selected building blocks mesh
View all blocks mesh
Save combined building blocks *.cbk
Close



*** Patch - FluSol Patch Mesh Generator: Versio...

File

Patch | Initial & Boundary conditions

Patch Mesh Generation

View mesh | Assembly blocks

Region Number: 6 | Write Mesh | Preview file | Close

Part name:

Reset Variables:

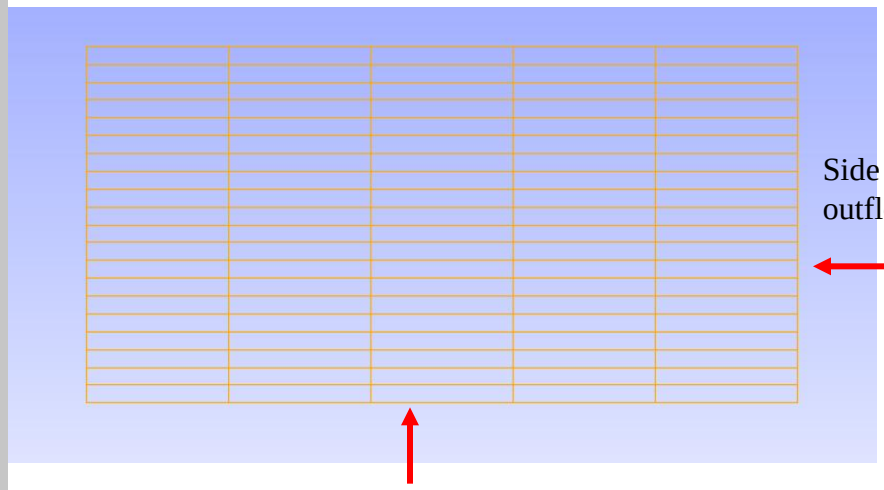
Upper Curve (Side 3)		Lower Curve (Side 1)	
ityu	0 Straight line	ityb	0 Straight line
slopu (line)	1.0	slopb (line)	0.0
radius (slopu)	1.0	radius (slopb)	0.0
Parabolic power (slopu):	1.0	Parabolic power (slopb):	0.0
X-Axis length (axu):	0.0	X-Axis length (axb):	0.0
Y-Axis length (ayu):	0.0	Y-Axis length (ayb):	0.0
strux	0	strlx	0
dxumin	0.1	dxlmin	0.1
residue	0.0001	stretch	0
factor	0.0	dymin:	0.0
Create wings		number of wings:	2
Cross section:	1 circular arc,	thick	0.05
wing location:	0	Total sweeping elements	60
NACA XXXX	None		
Upper wing profile			
lower wing profile			

Node coordinates

node: quad 4

elex: 5 | eley: 20

Node 1	X1:	1.0	Y1:	0.1
Node 2	X2:	1.2	Y2:	0.1
Node 3	X3:	1.2	Y3:	0.2
Node 4	X4:	1.0	Y4:	0.2



List of...

File Name

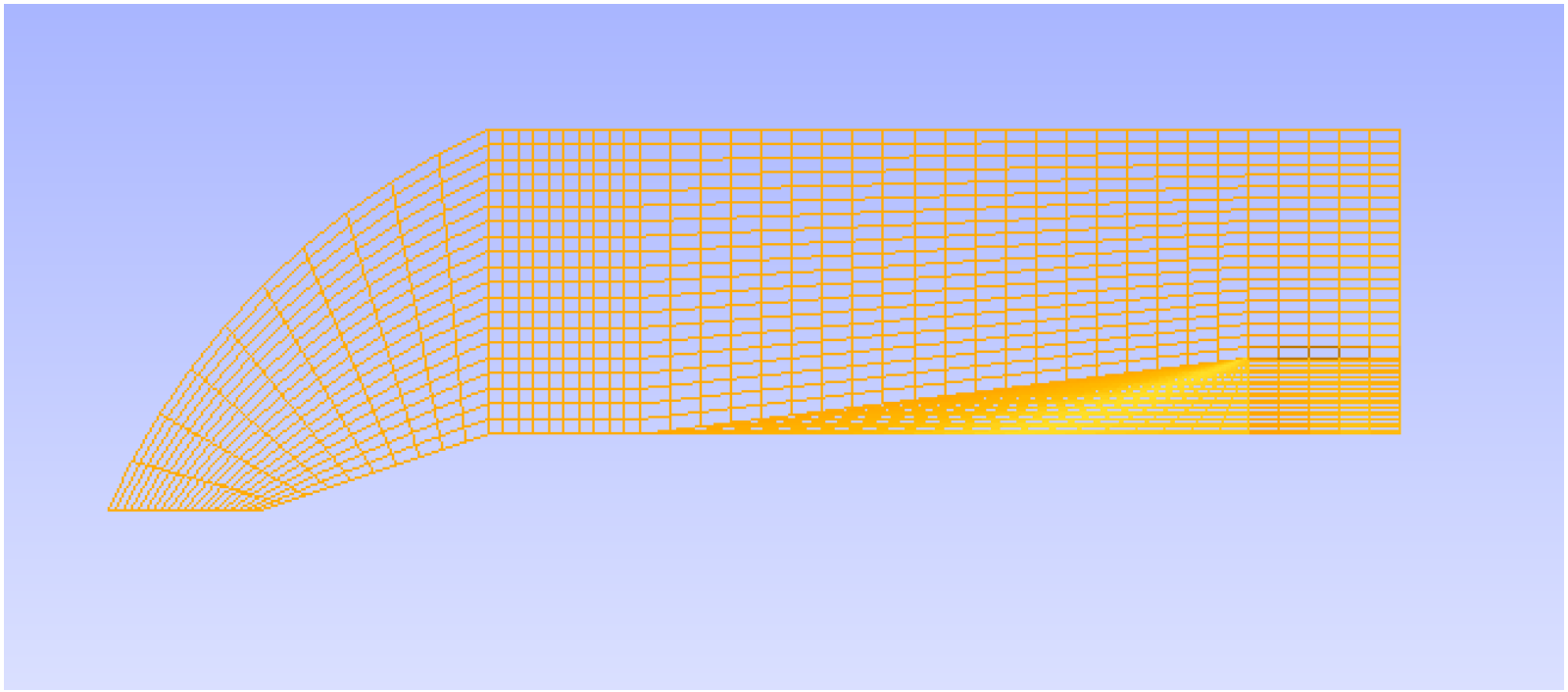
- [x] 1_nose.blk
- [x] 2_cylinder.blk
- [x] 3_cylinder_top.blk
- [x] 4_wing.blk
- [x] 5_after_wing_top.blk
- [x] 6_after_wing_bottom.blk
- [ ] f8.cbk

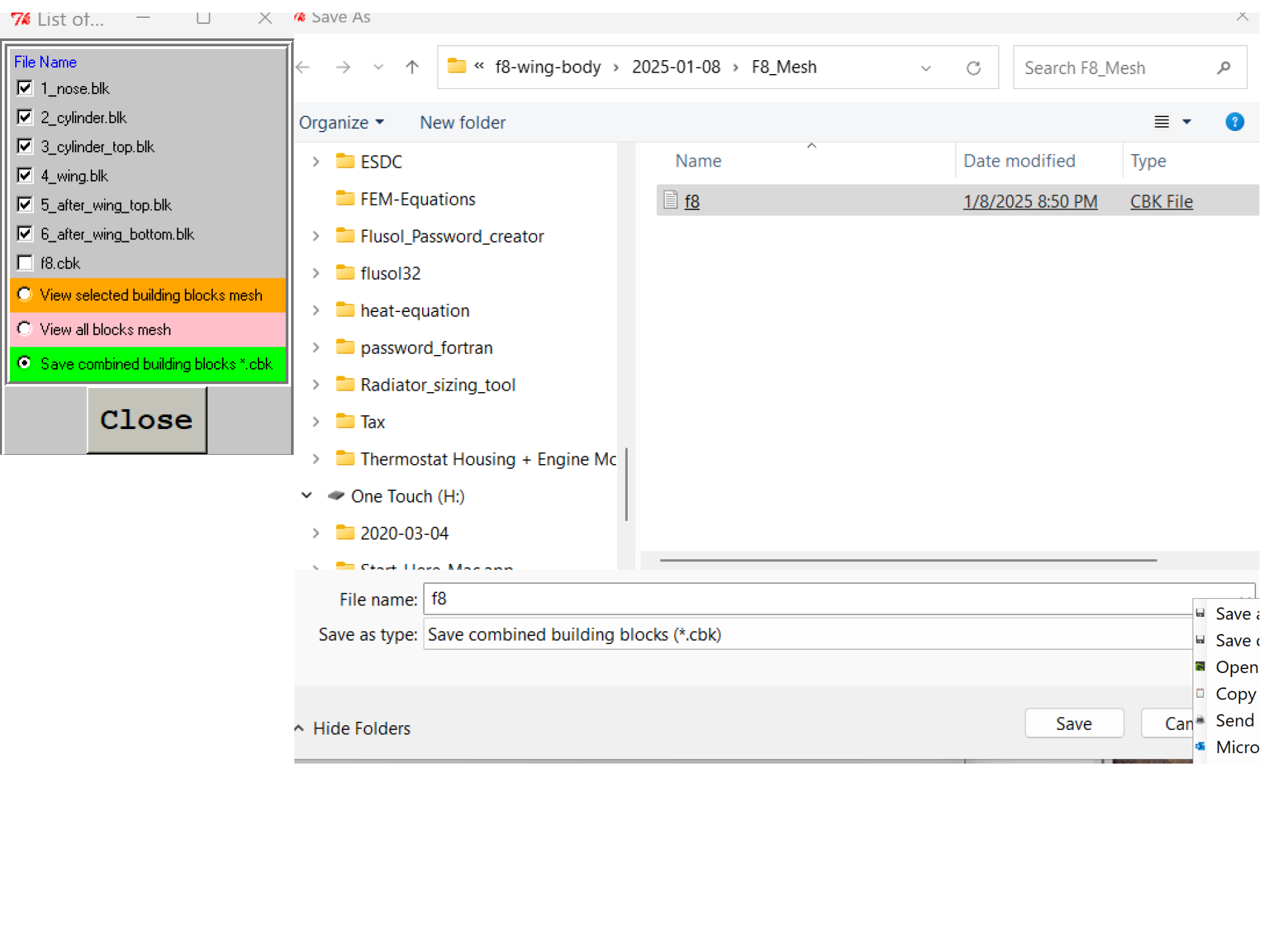
( ) View selected building blocks mesh

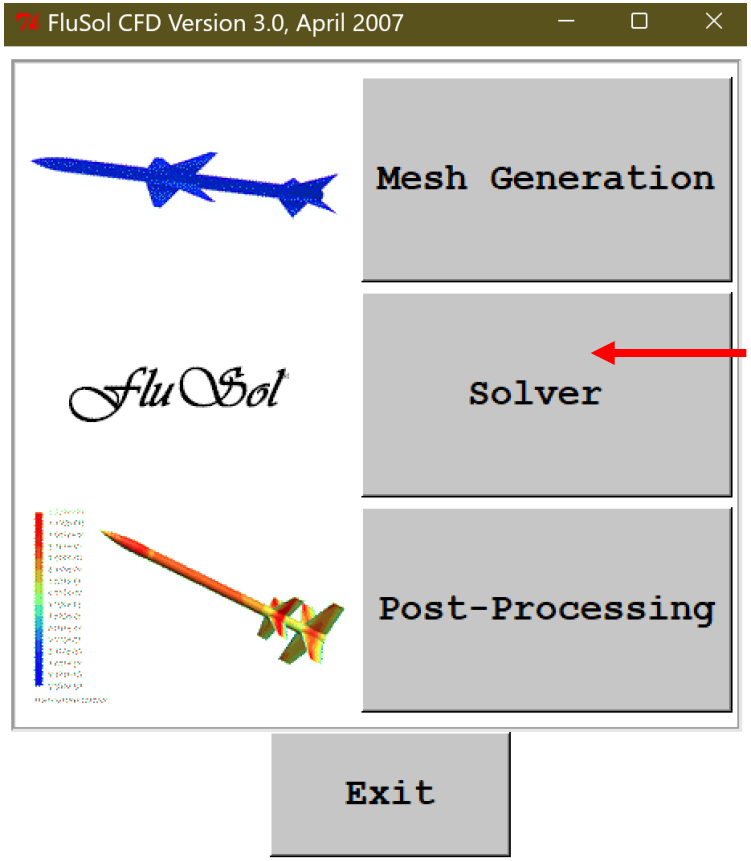
( ) View all blocks mesh

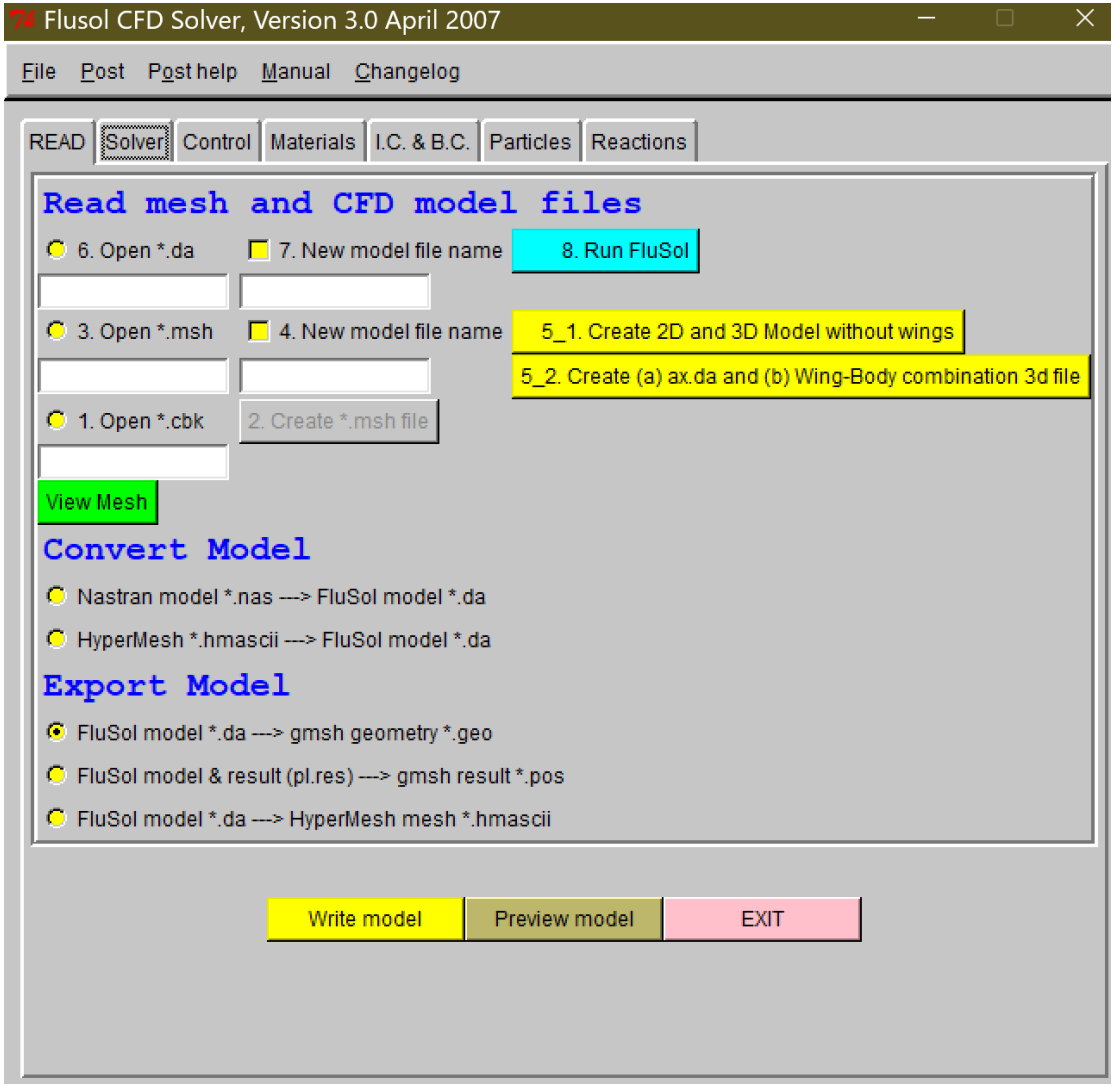
( ) Save combined building blocks *.cbk

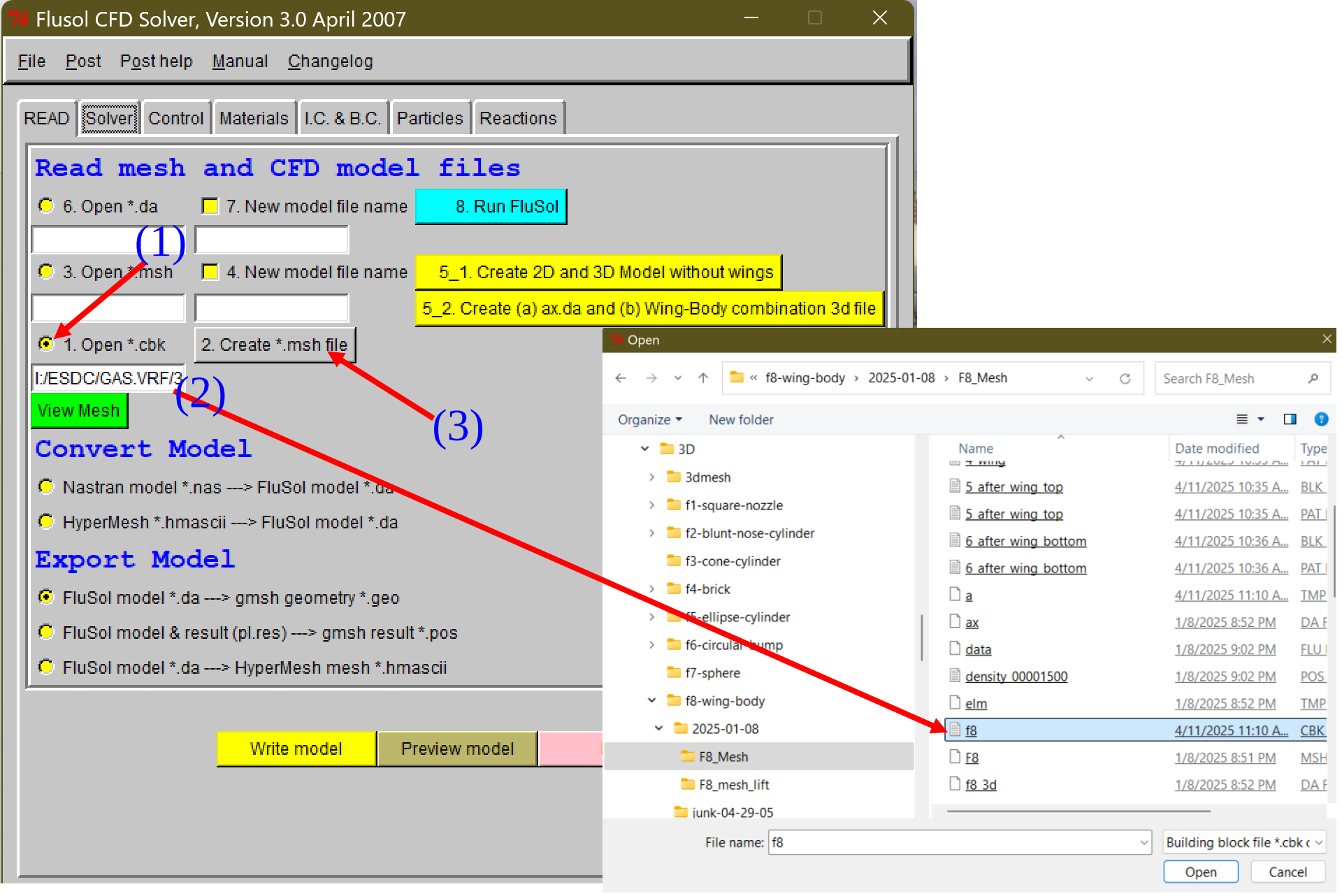
Close

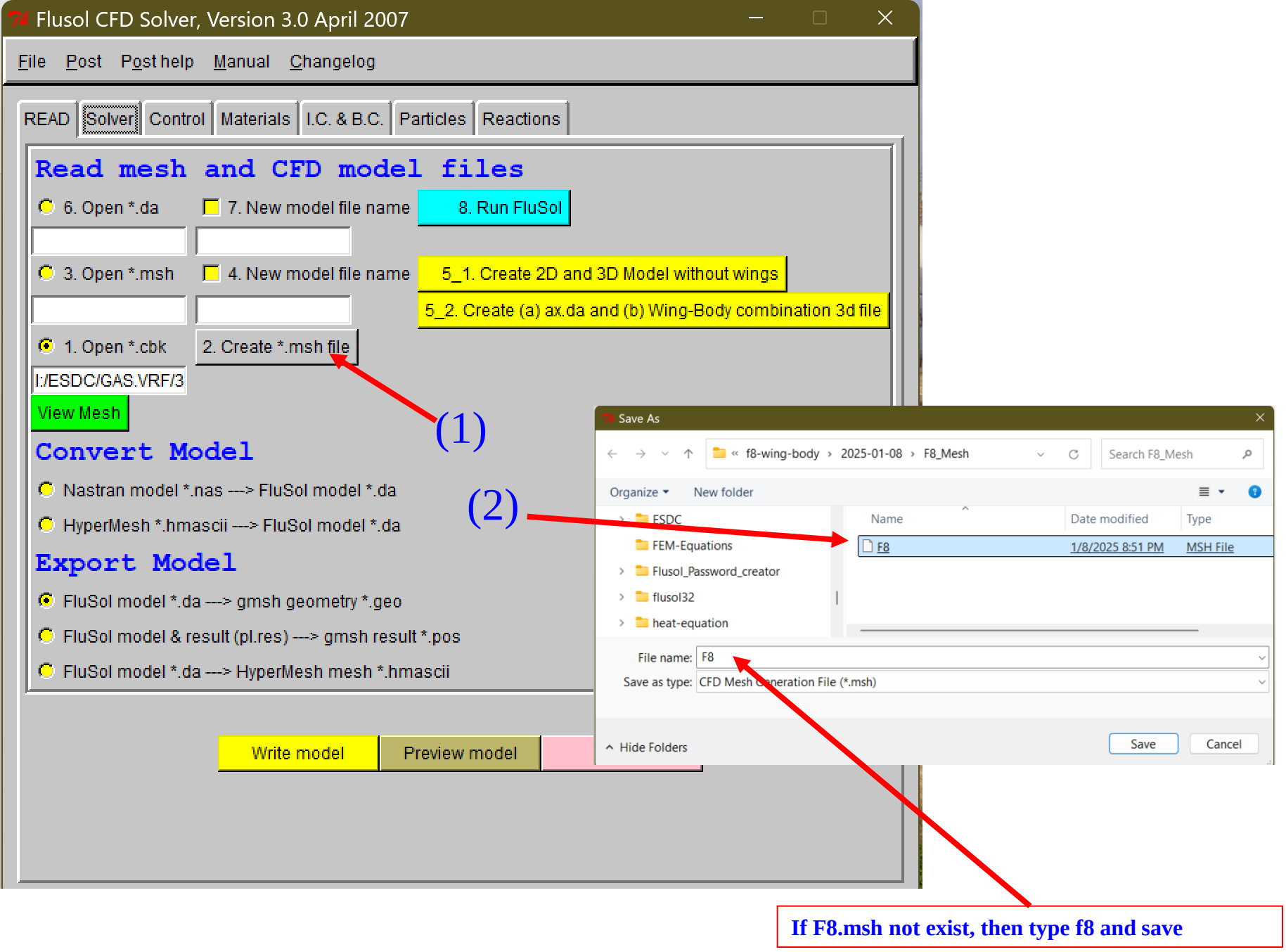


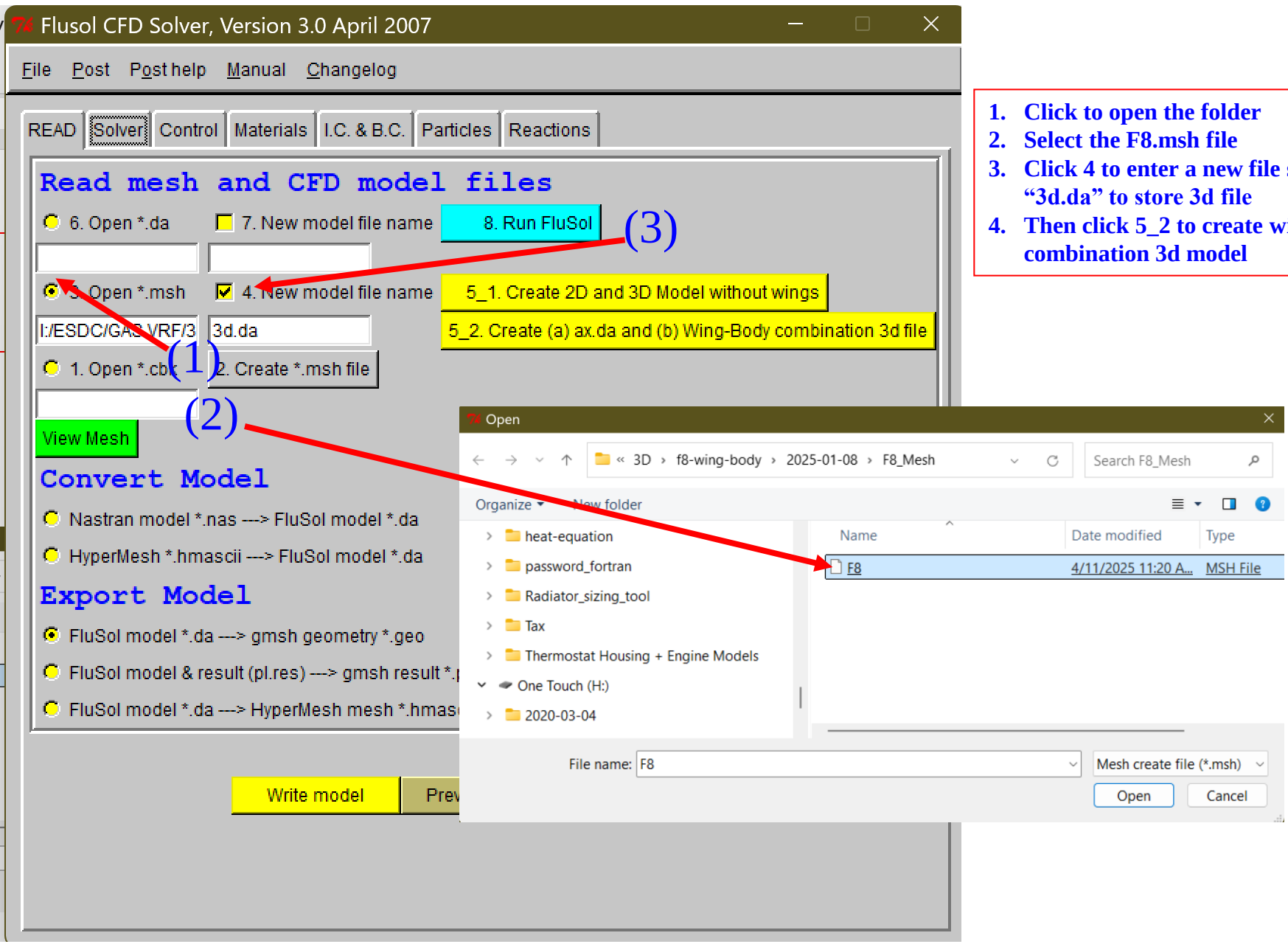

List of...
File Name
1_nose.blk
2_cylinder.blk
3_cylinder_top.blk
4_wing.blk
5_after_wing_top.blk
6_after_wing_bottom.blk
f8.cbk
View selected building blocks mesh
View all blocks mesh
Save combined building blocks *.cbk
Close
Save As
f8-wing-body › 2025-01-08 › F8_Mesh
Search F8_Mesh
Organize
New folder
ESDC
FEM-Equations
Flusol_Password_creator
flusol32
heat-equation
password_fortran
Radiator_sizing_tool
Tax
Thermostat Housing + Engine Mc
One Touch (H:)
2020-03-04
Name
Date modified
Type
f8
1/8/2025 8:50 PM
CBK File
File name: f8
Save as type: Save combined building blocks (*.cbk)
Hide Folders
Save
Can
Save a
Save c
Open
Copy
Send
Micro


FluSol CFD Version 3.0, April 2007
Mesh Generation
FluSol
Solver
Post-Processing
Exit

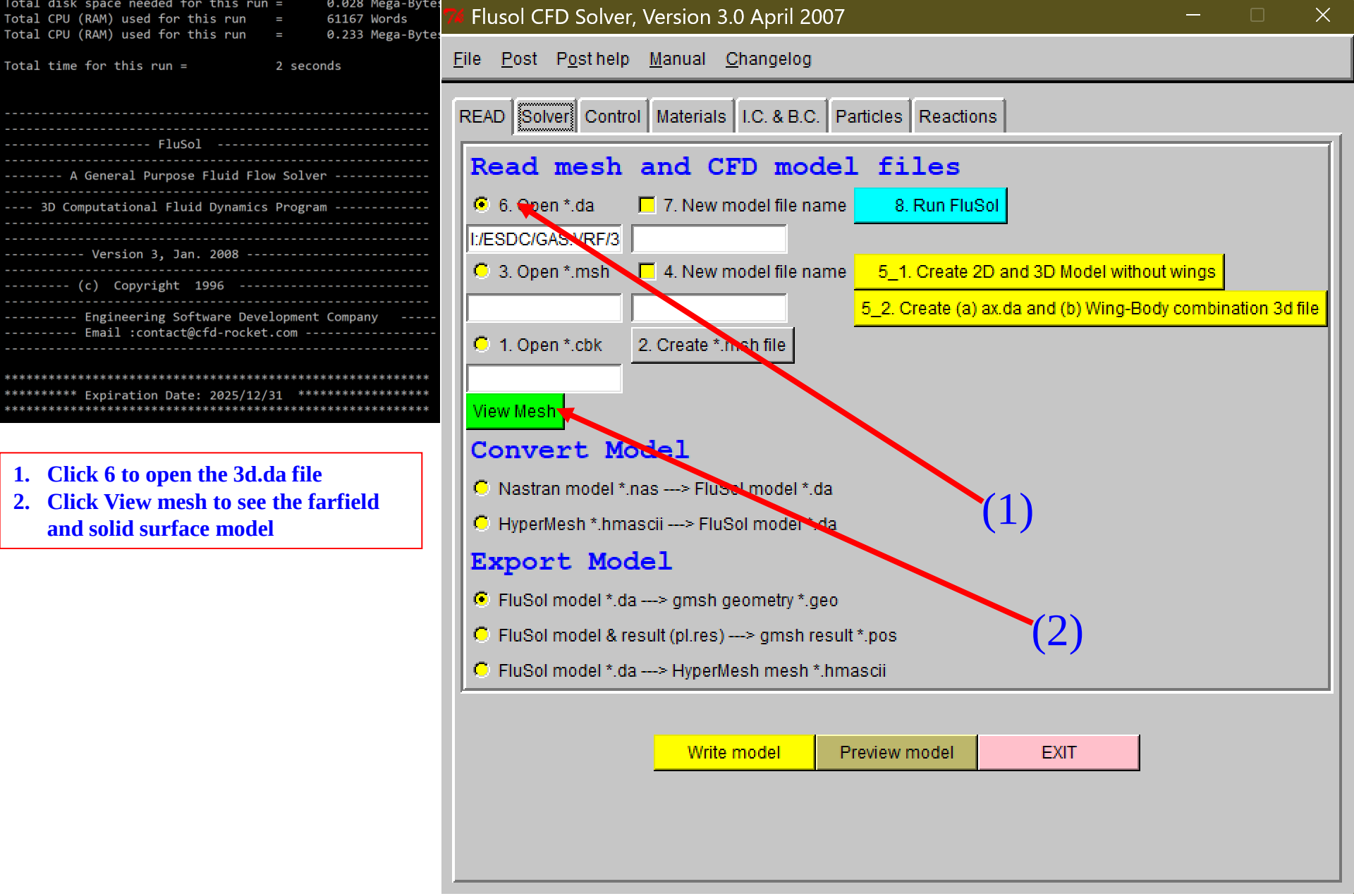

Flusol CFD Solver, Version 3.0 April 2007
File
Post
Post help
Manual
Changelog
READ
Solver
Control
Materials
I.C. & B.C.
Particles
Reactions
Read mesh and CFD model files
6. Open *.da
7. New model file name
8. Run FluSol
3. Open *.msh
4. New model file name
5_1. Create 2D and 3D Model without wings
5_2. Create (a) ax.da and (b) Wing-Body combination 3d file
1. Open *.cbk
2. Create *.msh file
View Mesh
Convert Model
Nastran model *.nas ---> FluSol model *.da
HyperMesh *.hmascii ---> FluSol model *.da
Export Model
FluSol model *.da ---> gmsh geometry *.geo
FluSol model & result (pl.res) ---> gmsh result *.pos
FluSol model *.da ---> HyperMesh mesh *.hmascii
Write model
Preview model
EXIT


Flusol CFD Solver, Version 3.0 April 2007
File
Post
Post help
Manual
Changelog
READ
Solver
Control
Materials
I.C. & B.C.
Particles
Reactions
Read mesh and CFD model files
6. Open *.da
7. New model file name
8. Run FluSol
3. Open *.msh
4. New model file name
5_1. Create 2D and 3D Model without wings
5_2. Create (a) ax.da and (b) Wing-Body combination 3d file
1. Open *.cbk
2. Create *.msh file
I:/ESDC/GAS.VRF/3
View Mesh
(1)
(2)
(3)
Convert Model
Nastran model *.nas ---> FluSol model *.da
HyperMesh *.hmascii ---> FluSol model *.da
Export Model
FluSol model *.da ---> gmsh geometry *.geo
FluSol model & result (pl.res) ---> gmsh result *.pos
FluSol model *.da ---> HyperMesh mesh *.hmascii
Write model
Preview model
Open
f8-wing-body › 2025-01-08 › F8_Mesh
Search F8_Mesh
Organize
New folder
3D
3dmesh
f1-square-nozzle
f2-blunt-nose-cylinder
f3-cone-cylinder
f4-brick
f7-sphere
f8-wing-body
2025-01-08
F8_Mesh
F8_mesh_lift
junk-04-29-05
Name
Date modified
Type
5_after_wing_top
4/11/2025 10:35 A...
BLK
5_after_wing_top
4/11/2025 10:35 A...
6_after_wing_bottom
4/11/2025 10:36 A...
BLK
6_after_wing_bottom
4/11/2025 10:36 A...
a
4/11/2025 11:10 A...
TMP
ax
1/8/2025 8:52 PM
data
1/8/2025 9:02 PM
density_00001500
1/8/2025 9:02 PM
POS
elm
1/8/2025 8:52 PM
TMP
f8
4/11/2025 11:10 A...
CBK
F8
1/8/2025 8:51 PM
MSH
f8_3d
1/8/2025 8:52 PM
File name: f8
Building block file *.cbk
Open
Cancel

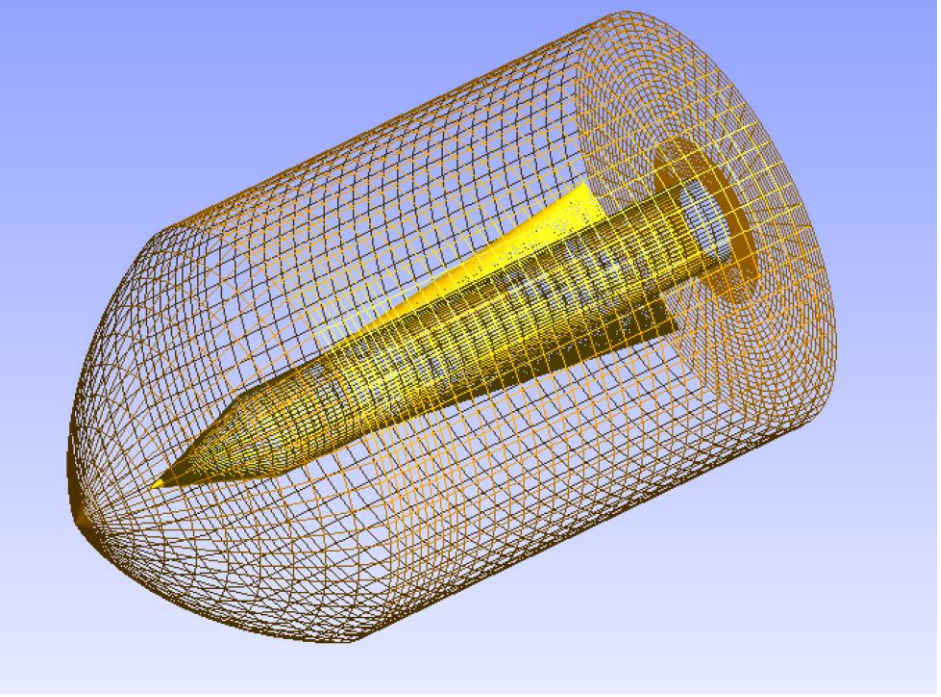

Flusol CFD Solver, Version 3.0 April 2007
File Post Post help Manual Changelog
READ Solver Control Materials I.C. & B.C. Particles Reactions
Read mesh and CFD model files
6. Open *.da
7. New model file name
8. Run FluSol
3. Open *.msh
4. New model file name
5_1. Create 2D and 3D Model without wings
5_2. Create (a) ax.da and (b) Wing-Body combination 3d file
1. Open *.cbk
2. Create *.msh file
I:/ESDC/GAS.VRF/3
View Mesh
Convert Model
Nastran model *.nas ---> FluSol model *.da
HyperMesh *.hmascii ---> FluSol model *.da
Export Model
FluSol model *.da ---> gmsh geometry *.geo
FluSol model & result (pl.res) ---> gmsh result *.pos
FluSol model *.da ---> HyperMesh mesh *.hmascii
Write model
Preview model
(1)
(2)
Save As
f8-wing-body › 2025-01-08 › F8_Mesh
Search F8_Mesh
Organize
New folder
ESDC
FEM-Equations
Flusol_Password_creator
flusol32
heat-equation
Name
Date modified
Type
F8
1/8/2025 8:51 PM
MSH File
File name: F8
Save as type: CFD Mesh Generation File (*.msh)
Hide Folders
Save
Cancel
If F8.msh not exist, then type f8 and save

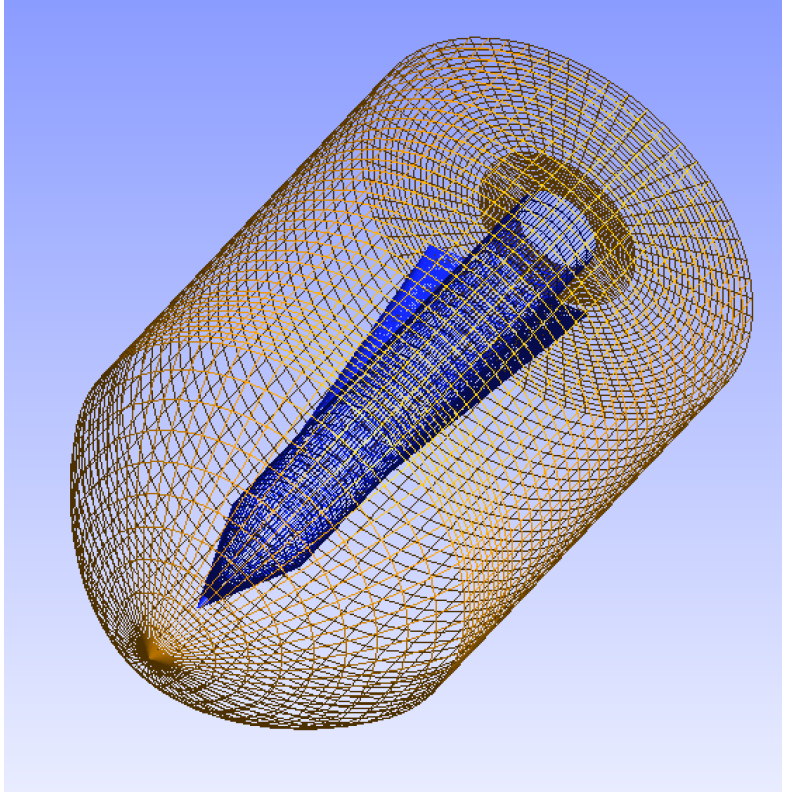


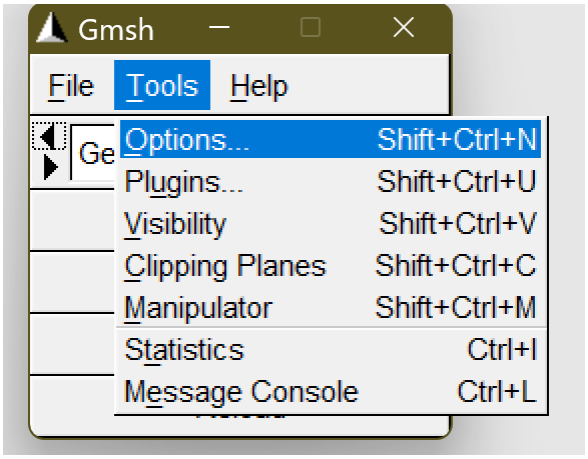
1. **Click to open the folder**
2. **Select the F8.msh file**
3. **Click 4 to enter a new file such as "3d.da" to store 3d file**
4. **Then click 5_2 to create wing-body combination 3d model**

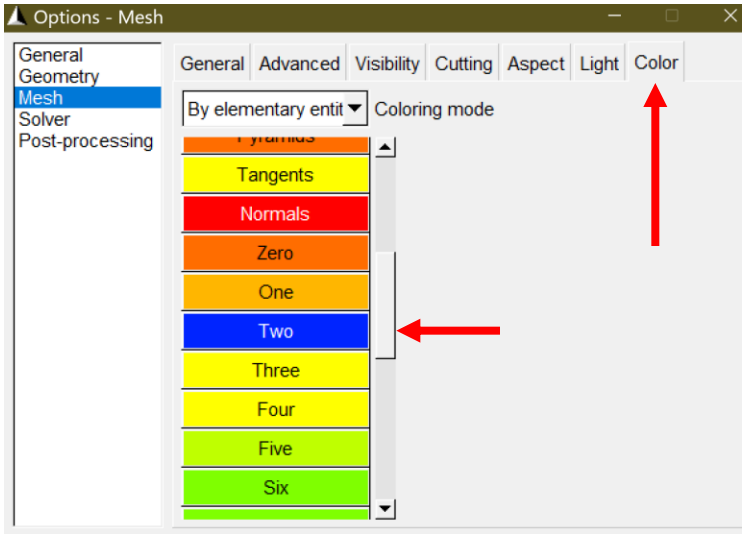


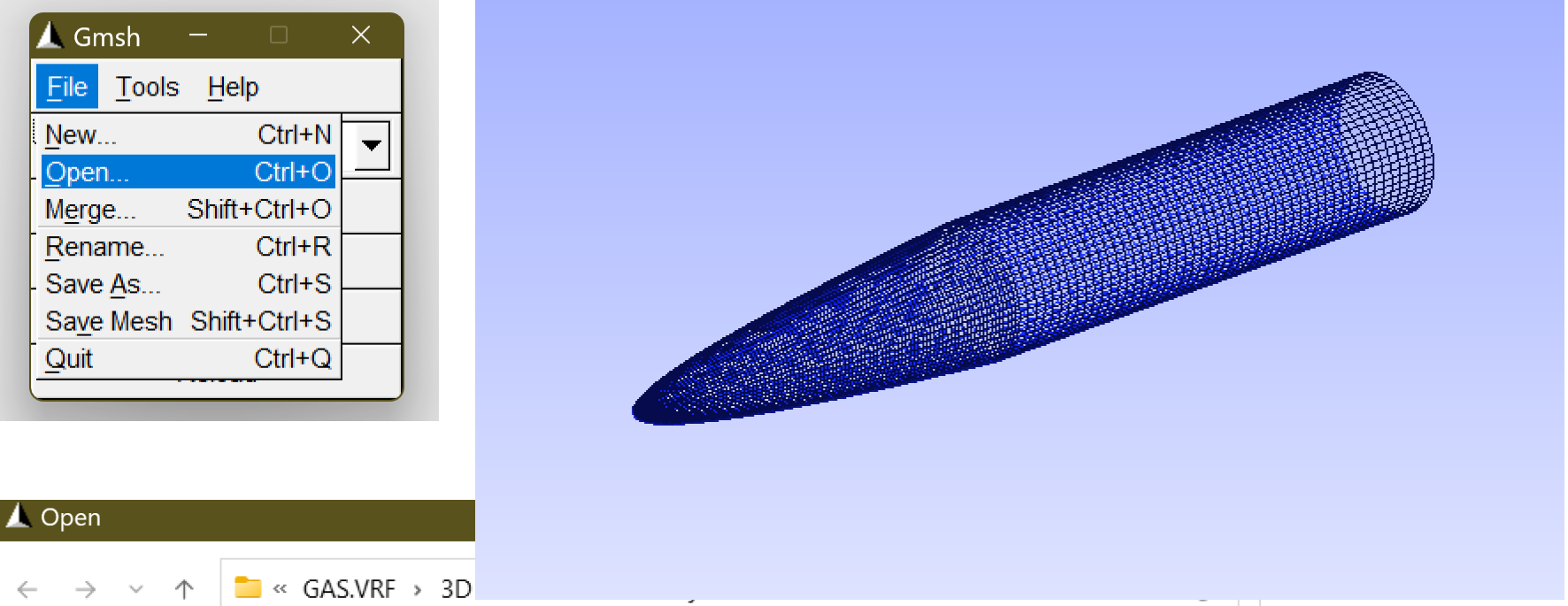
1. **Click 6 to open the 3d.da file**
2. **Click View mesh to see the farfield and solid surface model**

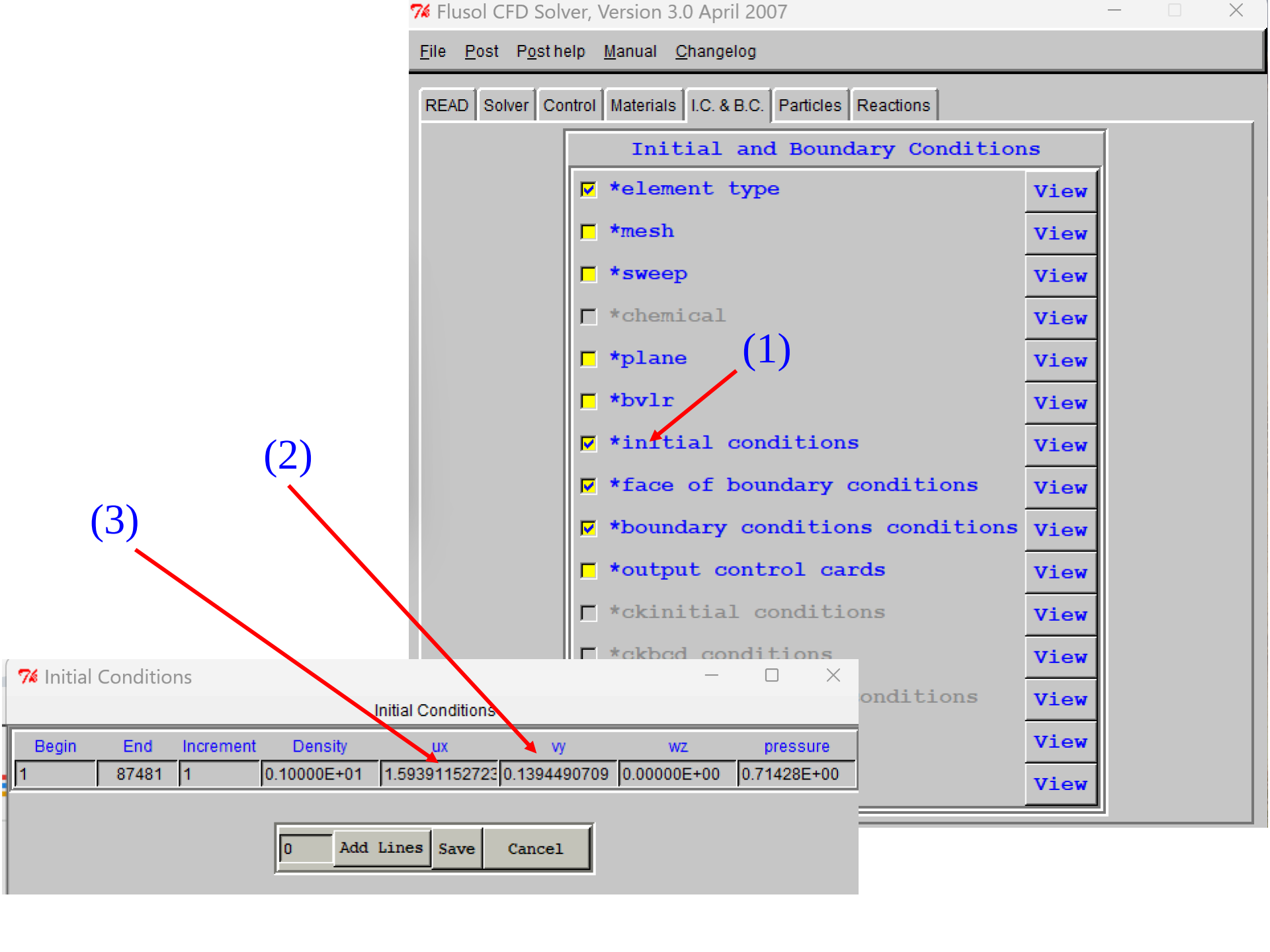


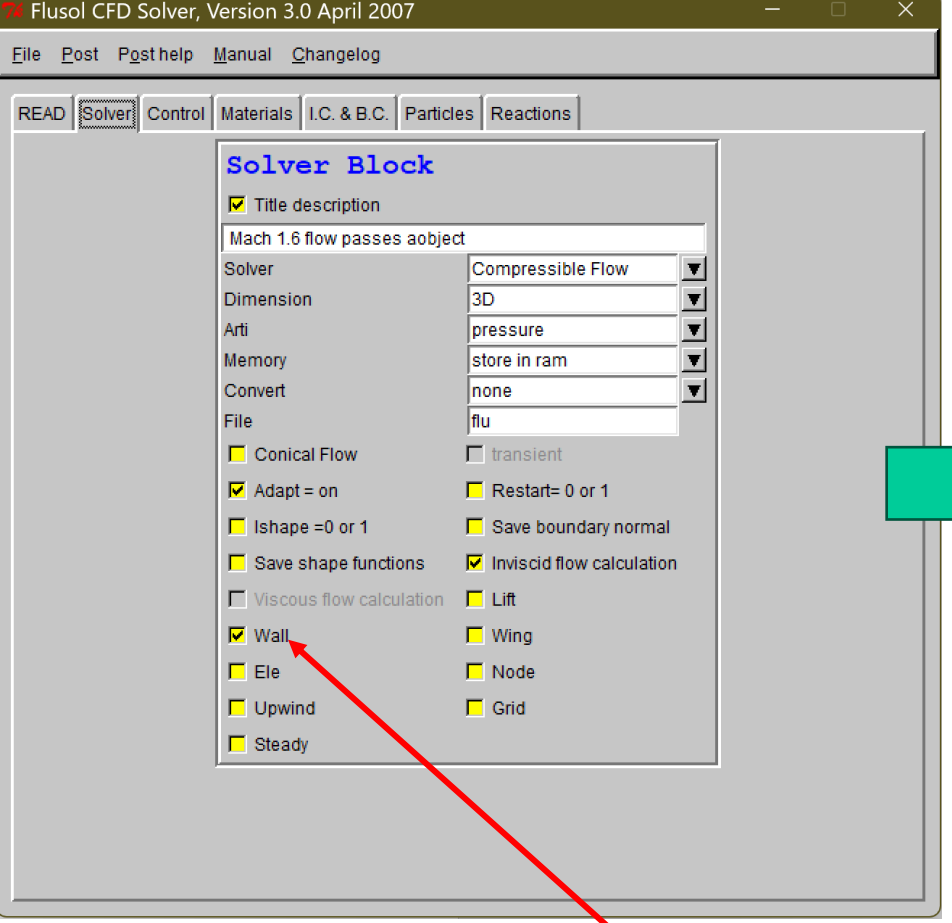


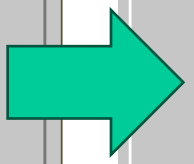

Gmsh
File
Tools
Help
Options... Shift+Ctrl+N
Plugins... Shift+Ctrl+U
Visibility Shift+Ctrl+V
Clipping Planes Shift+Ctrl+C
Manipulator Shift+Ctrl+M
Statistics Ctrl+I
Message Console Ctrl+L

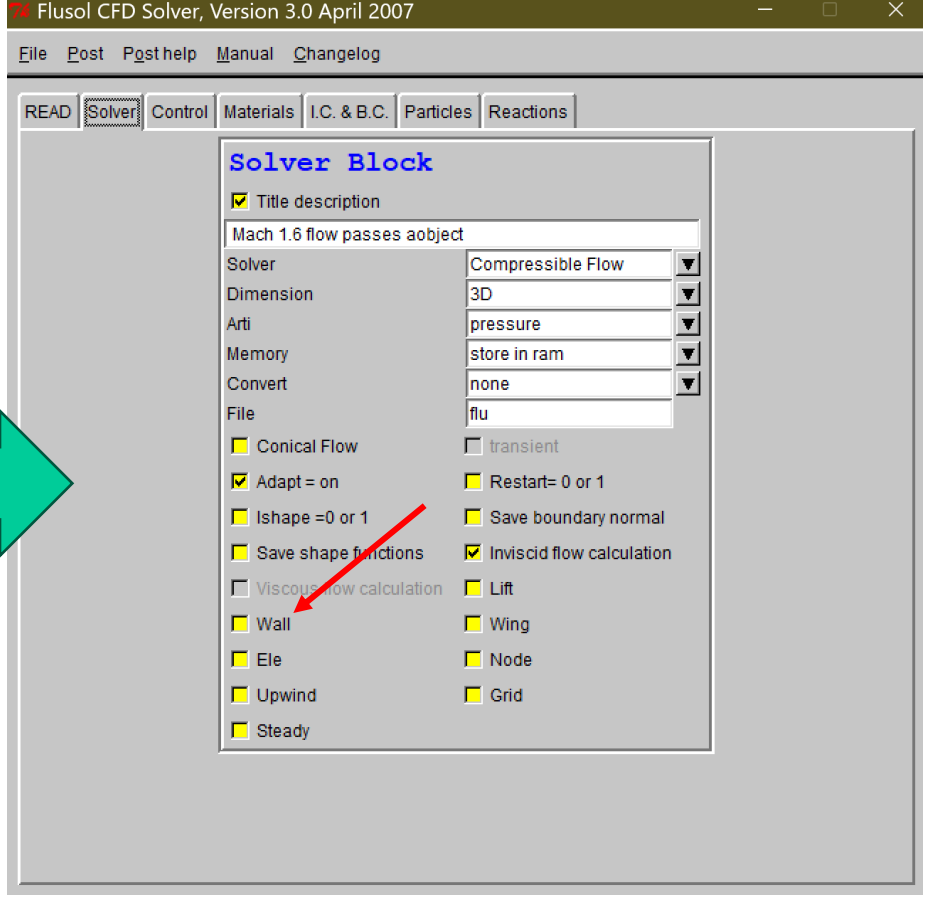

Options - Mesh
General
Geometry
Mesh
Solver
Post-processing
General
Advanced
Visibility
Cutting
Aspect
Light
Color
By elementary entit
Coloring mode
Tangents
Normals
Zero
One
Two
Three
Four
Five
Six


Gmsh
File
Tools
Help
New... Ctrl+N
Open... Ctrl+O
Merge... Shift+Ctrl+O
Rename... Ctrl+R
Save As... Ctrl+S
Save Mesh Shift+Ctrl+S
Quit Ctrl+Q
Open
« GAS.VRF › 3D
Organize
New folder
Flusol_Password_creator
flusol32
heat-equation
password_fortran
Radiator_sizing_tool
Tax
Thermostat Housing + Engine Models
Install Security for Mac
One Touch (H:)
2020-03-04
Name
Date modified
Type
flu 4/10/2025 5:24 PM GEO File
gap 4/10/2025 5:24 PM LOG File
geo.bln 4/10/2025 5:23 PM BLN File
gmsh_axis 4/10/2025 5:24 PM GEO File
gmsh_farfield 4/10/2025 5:24 PM GEO File
gmsh_wall 4/10/2025 5:24 PM GEO File
junk 4/10/2025 8:56 PM 3 File
mach.bln 4/10/2025 5:54 PM BLN File
mach_number_00001500 4/10/2025 5:54 PM POS File
model 4/10/2025 5:24 PM TMP File

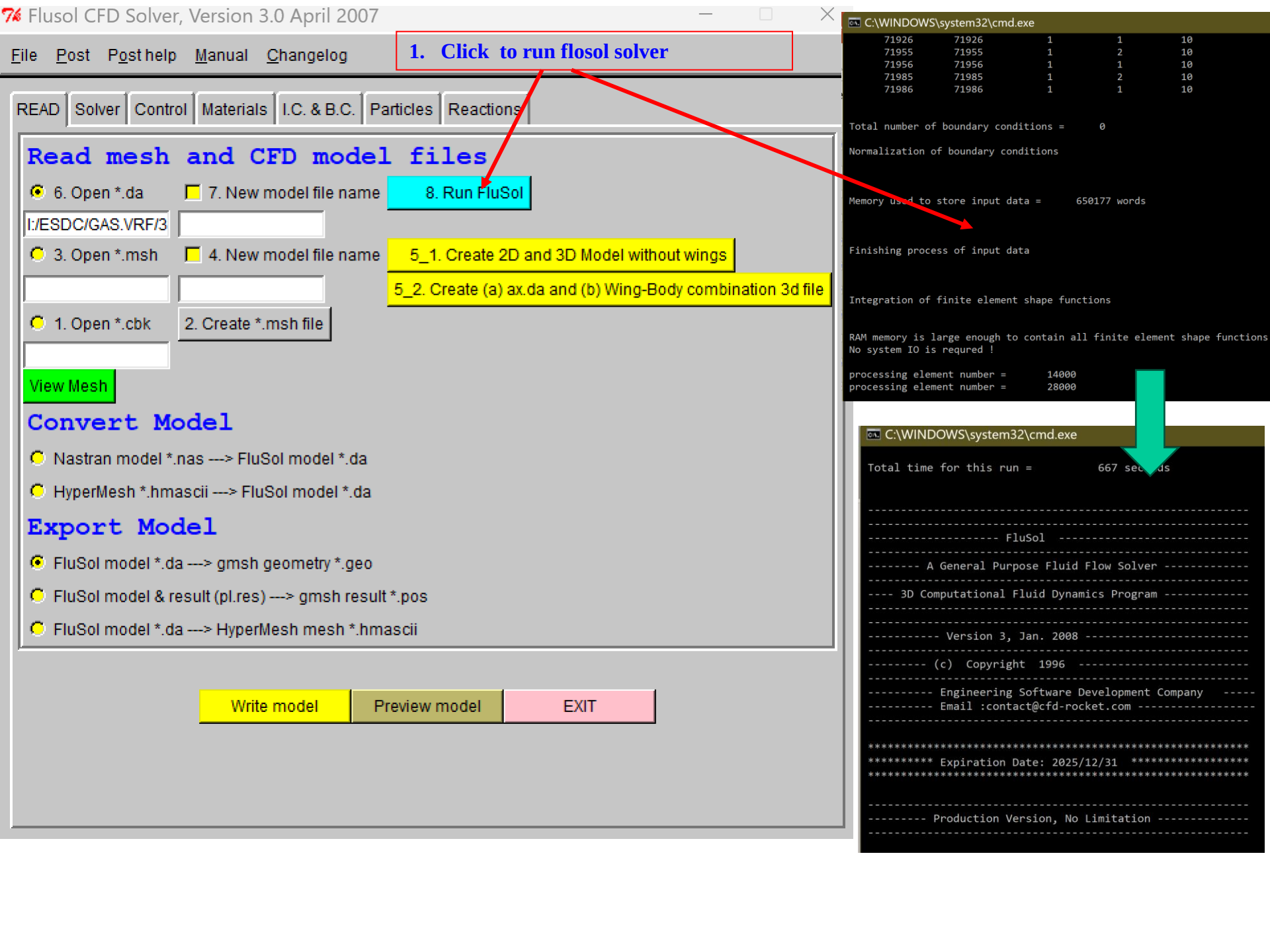

Flusol CFD Solver, Version 3.0 April 2007
File Post Post help Manual Changelog
READ Solver Control Materials I.C. & B.C. Particles Reactions
Initial and Boundary Conditions
*element type View
*mesh View
*sweep View
*chemical View
*plane View
*bvlr View
*initial conditions View
*face of boundary conditions View
*boundary conditions conditions View
*output control cards View
*ckinitial conditions View
View
View
View
(1)
(2)
(3)
Initial Conditions
Initial Conditions
Begin End Increment Density ux vy wz pressure
1 87481 1 0.10000E+01 1.59391152723 0.1394490709 0.00000E+00 0.71428E+00
0 Add Lines Save Cancel



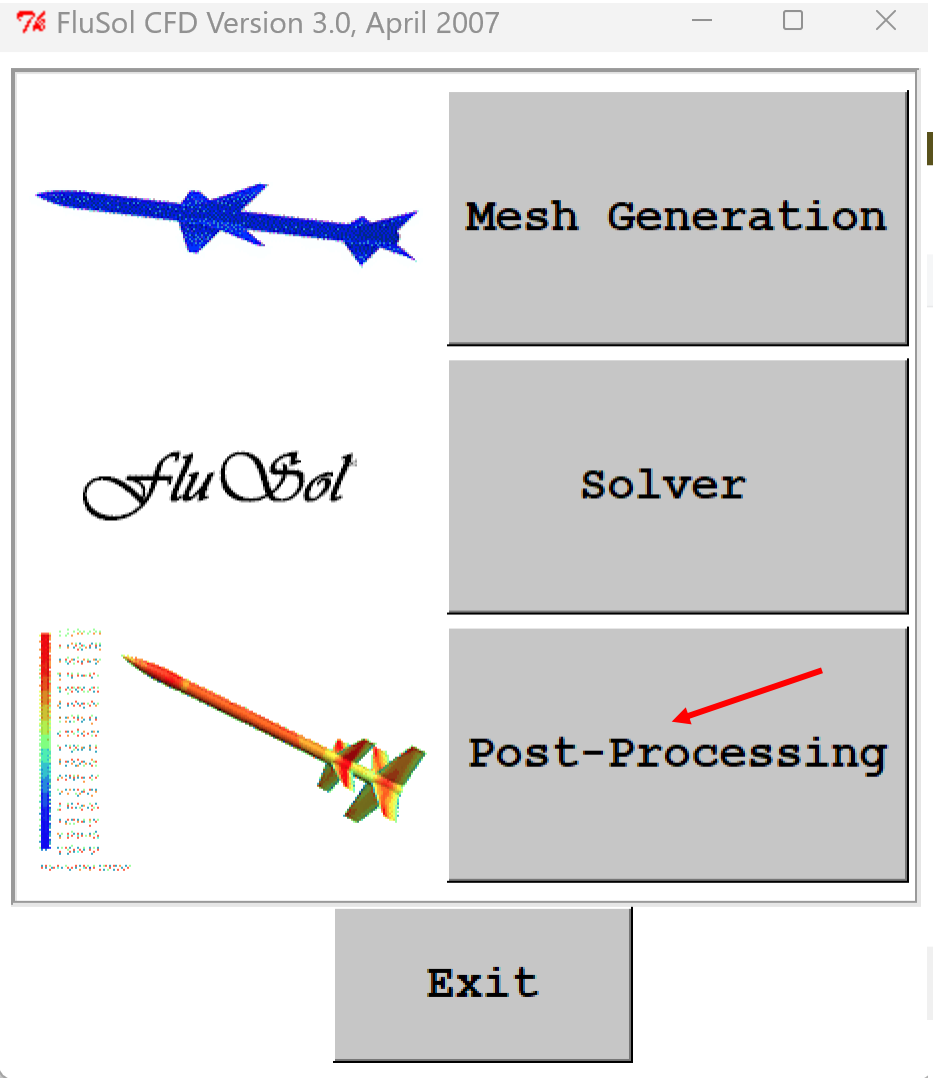


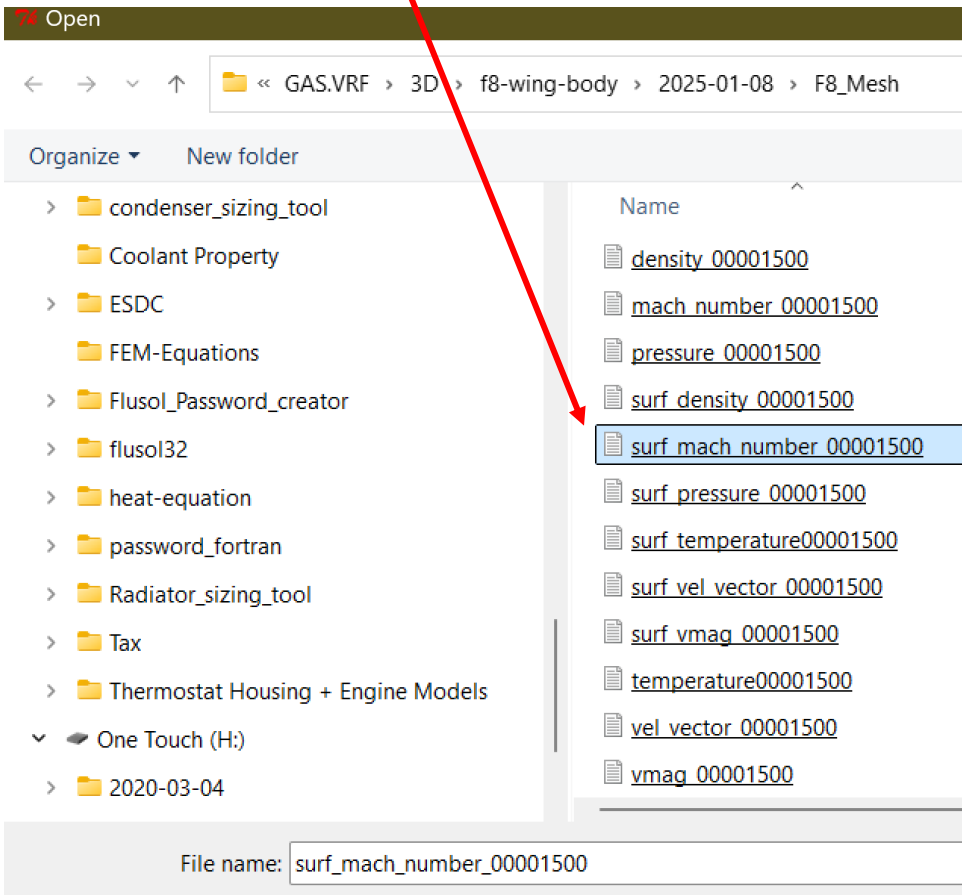


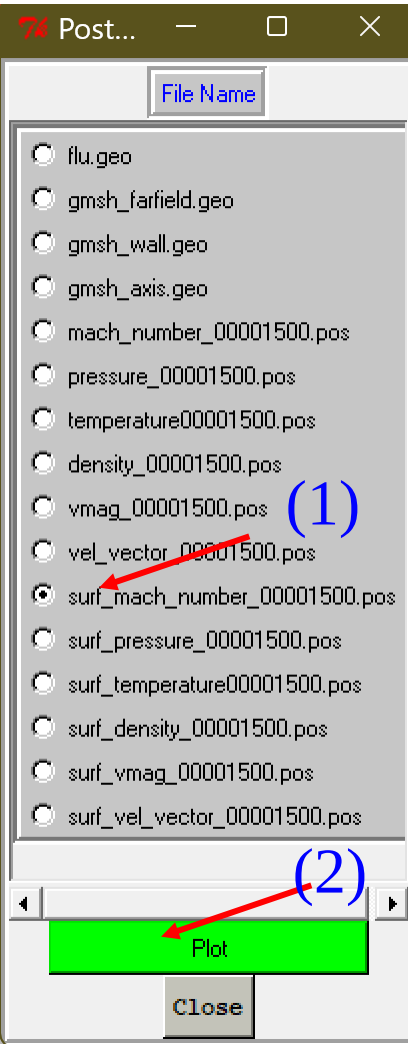
1. **Click to turn off wall check button**

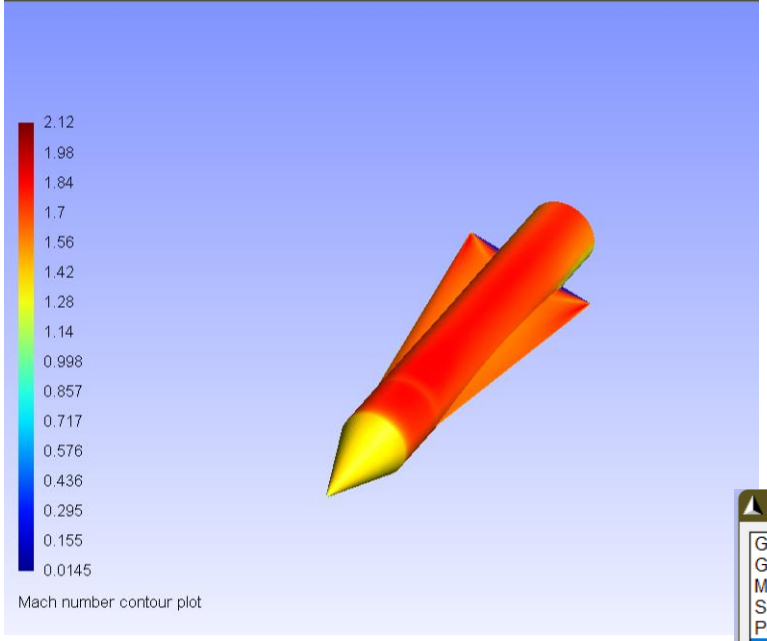

Flusol CFD Solver, Version 3.0 April 2007
File
Post
Post help
Manual
Changelog
1. Click to run flosol solver
READ
Solver
Control
Materials
I.C. & B.C.
Particles
Reactions
Read mesh and CFD model files
6. Open *.da
7. New model file name
8. Run FluSol
I:/ESDC/GAS.VRF/3
3. Open *.msh
4. New model file name
5_1. Create 2D and 3D Model without wings
5_2. Create (a) ax.da and (b) Wing-Body combination 3d file
1. Open *.cbk
2. Create *.msh file
View Mesh
Convert Model
Nastran model *.nas ---> FluSol model *.da
HyperMesh *.hmascii ---> FluSol model *.da
Export Model
FluSol model *.da ---> gmsh geometry *.geo
FluSol model & result (pl.res) ---> gmsh result *.pos
FluSol model *.da ---> HyperMesh mesh *.hmascii
Write model
Preview model
EXIT
C:\WINDOWS\system32\cmd.exe
71926 71926 1 1 10
71955 71955 1 2 10
71956 71956 1 1 10
71985 71985 1 2 10
71986 71986 1 1 10
Total number of boundary conditions = 0
Normalization of boundary conditions
Memory used to store input data = 650177 words
Finishing process of input data
Integration of finite element shape functions
RAM memory is large enough to contain all finite element shape functions
No system IO is requred !
processing element number = 14000
processing element number = 28000
C:\WINDOWS\system32\cmd.exe
Total time for this run = 667 seconds
FluSol
A General Purpose Fluid Flow Solver
3D Computational Fluid Dynamics Program
Version 3, Jan. 2008
(c) Copyright 1996
Engineering Software Development Company
Email :contact@cfd-rocket.com
Expiration Date: 2025/12/31
Production Version, No Limitation

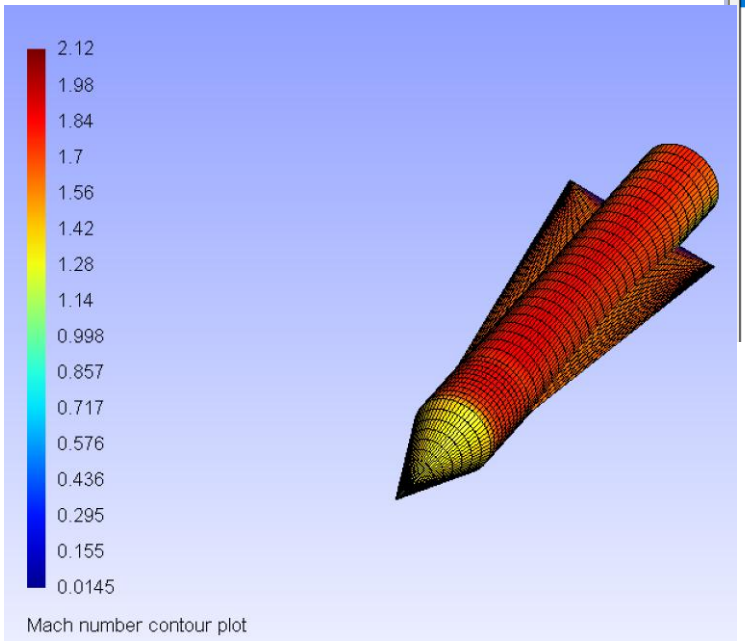
1. **Click Post-Prosessing**
2. **Select surface_mach file**

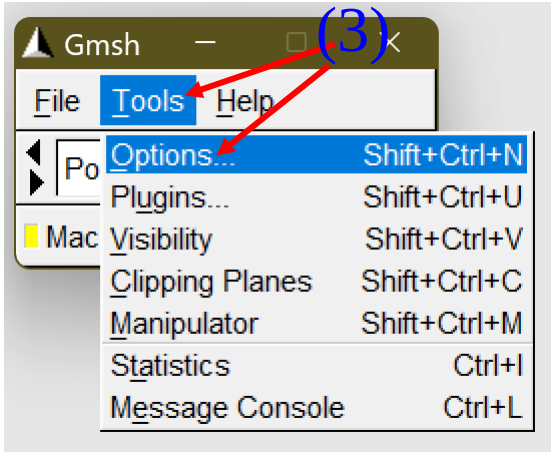


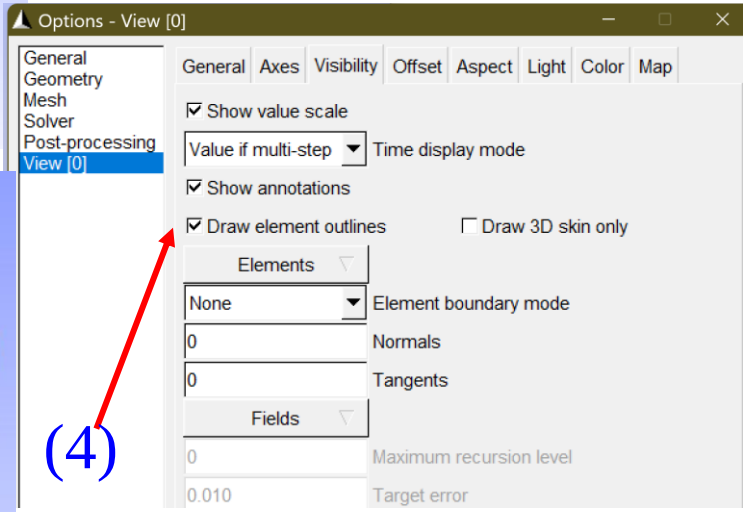



Post...
File Name
flu.geo
gmsh_farfield.geo
gmsh_wall.geo
gmsh_axis.geo
mach_number_00001500.pos
pressure_00001500.pos
temperature00001500.pos
density_00001500.pos
vmag_00001500.pos
vel_vector_00001500.pos
surf_mach_number_00001500.pos
surf_pressure_00001500.pos
surf_temperature00001500.pos
surf_density_00001500.pos
surf_vmag_00001500.pos
surf_vel_vector_00001500.pos
(1)
(2)
Plot
Close


2.12
1.98
1.84
1.7
1.56
1.42
1.28
1.14
0.998
0.857
0.717
0.576
0.436
0.295
0.155
0.0145
Mach number contour plot


2.12
1.98
1.84
1.7
1.56
1.42
1.28
1.14
0.998
0.857
0.717
0.576
0.436
0.295
0.155
0.0145
Mach number contour plot


Gmsh
File
Tools
Help
Options... Shift+Ctrl+N
Plugins... Shift+Ctrl+U
Visibility Shift+Ctrl+V
Clipping Planes Shift+Ctrl+C
Manipulator Shift+Ctrl+M
Statistics Ctrl+I
Message Console Ctrl+L
(3)


Options - View [0]
General
Geometry
Mesh
Solver
Post-processing
View [0]
General
Axes
Visibility
Offset
Aspect
Light
Color
Map
Show value scale
Value if multi-step
Time display mode
Show annotations
Draw element outlines
Draw 3D skin only
Elements
None
Element boundary mode
0
Normals
0
Tangents
Fields
0
Maximum recursion level
0.010
Target error
(4)