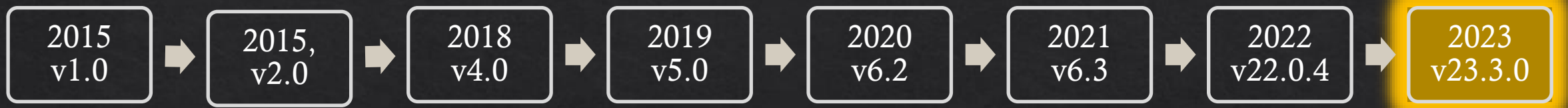
BARAM, CFD for Everyone

Unleash the Power of your Cluster

The Journey so far


2015
v1.0
2015,
v2.0
2018
v4.0
2019
v5.0
2020
v6.2
2021
v6.3
2022
v22.0.4
2023
v23.3.0

Baram - C:\Users\jakej\Documents\tmp\baramTestProjects\mixingPipe

File Mesh View Settings

- Setup
  - General
  - Materials
  - Models
  - Cell Zone Conditions
  - Boundary Conditions
  - Reference Values
- Solution
  - Numerial Conditions
  - Monitors
  - Initialization
  - Calculate Conditions
  - Run Calculation

Boundary Conditions

filter string is here

- region0
  - **in-1** Velocit
  - **in-2** Velocit
  - **out** Pressu
  - **wall** Wall

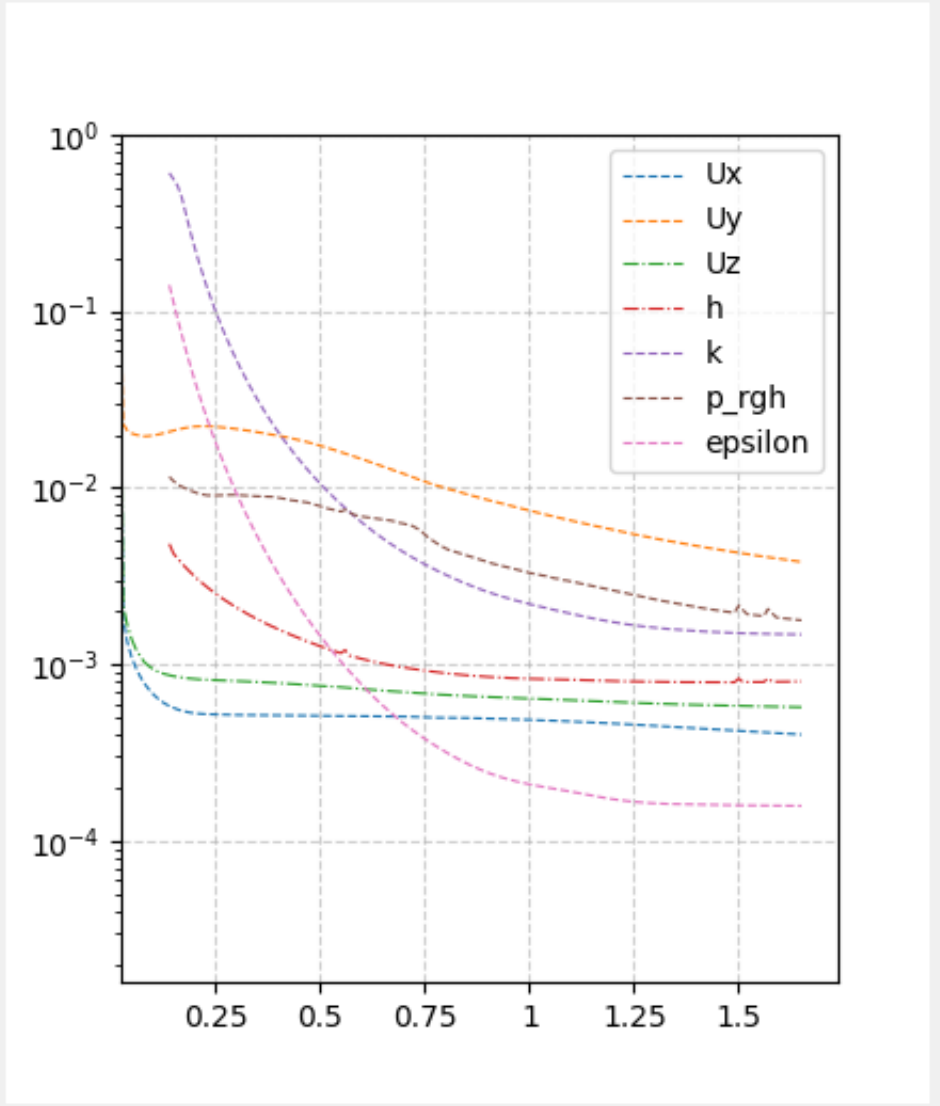
Inlet
- Velocity Inlet
- Flow Rate Inlet
- Pressure Inlet
- ABL Inlet
- Open Channle Inlet
- Free Stream
- Far-field Riemann
- Subsonic Inflow
- Supersonic Inflow

Outlet
- Pressure Outlet
- OpenChannel Outlet
- Outflow
- Subsonic Outflow
- Supersonic Outflow

Wall
- Wall
- Thermo-Coupled Wall

Misc.
- Symmetry
- Interface
- Empty
- Cyclic
- Wedge
- Porous Jump
- FAN

Residuals



Console Mesh Residuals

nextfoam/baram: CFD for Every

https://github.com/nextfoam/baram

nextfoam / baram

Type / to search

Code | Issues 12 | Pull requests | Discussions | Actions | Projects | Wiki | Security | Insights | Settings

baram

Public

Edit Pins | Unwatch 1 | Fork 9 | Starred 39

main | 4 branches | 11 tags | Go to file | Add file | Code

jiban Default value changed to one half of the value of FeatureAngle. 4a6e873 7 hours ago 1,125 commits

.github/ISSUE_TEMPLATE	Update issue templates	last year
PyFoam	Issue #248, inline "table" like following can be mishandled.	2 months ago
baramFlow	Merge branch 'pbmean'	7 hours ago
baramMesh	Default value changed to one half of the value of FeatureAngle.	7 hours ago
gradle/wrapper	"gradle" will compile UI file.	last year
libbaram	Issue #349 baramMesh export 프로젝트 여부 확인을 위해 baram.foam...	yesterday
resources	Issue #341, Unused widget removed and icon changed	last week
widgets	커밋 누락 파일 (parallel environment 설정 및 병렬 실행 기능 상위 라이...	3 weeks ago
.gitignore	Issue #304 baramSnappy has been merged	last month
INSTALL.md	vtk 9.1.0 is not available for Python 3.10	last year
LICENSE	Initial commit	last year
README.md	Typo	10 months ago

About

CFD for Everyone

baramcfd.org/

python | open-source | cfd | openfoam

Readme

GPL-3.0 license

Activity

39 stars

1 watching

9 forks

Report repository

Releases

11 tags

Create a new release

baramcfd.org

BARAM

Screenshots
Features
Installation
Internationalization
Release Notes
Guides
BARAM on GitHub

BARAM is a Free Open Source Computational Fluid Dynamics (CFD) software package. *BARAM* is developed to mitigate the steep learning curve of Text-based Solvers. *BARAM* helps you focus on a problem itself with intuitive graphical user interface. For now, *OpenFOAM®* solvers modified by *NEXTFOAM* are integrated into *BARAM*. *NEXTFOAM* develops and releases it under GNU Public License (GPL).

"BARAM" (pronounced like 'baa-laam') is a Korean word that means "wind".

BARAM package has two applications, *BaramFlow* and *BaramMesh*. *BaramMesh* generates mesh for calculation, and *BaramFlow* calculates fluid dynamics with that mesh.

Source code of *BARAM* is published on GitHub, and *BARAM* supports following platforms.

```
* Ubuntu 20.04 or later
* CentOS 8.2 or alternatives ( Rocky Linux, AlmaLinux, ... )
* OpenSUSE Leap 15.4
* Linux Mint 21 "Vanessa"
* Windows 10 or later
* macOS 10.14 or later
```

For installation from the source code, please refer to Installation page.

Binary installation package for 64-bit windows is here for convenience.

Download BARAM v23.3.0 Installer for 64-bit Windows ›

- Incompressible Flow
- Buoyant Flow
- Multi-Phase (VOF)
- Conjugate Heat Transfer (CHT) Multi-Region

- Steady/Transient Case
- Cell Zones
  - Porous Zone
  - Sliding Mesh
  - Actuator Disk
  - Multiple Reference Frame (MRF)
- Turbulence models
  - K-Epsilon
  - K-Omega
  - Spalart-Allmaras

One Step Forward

blockMesh

snappyHexMesh

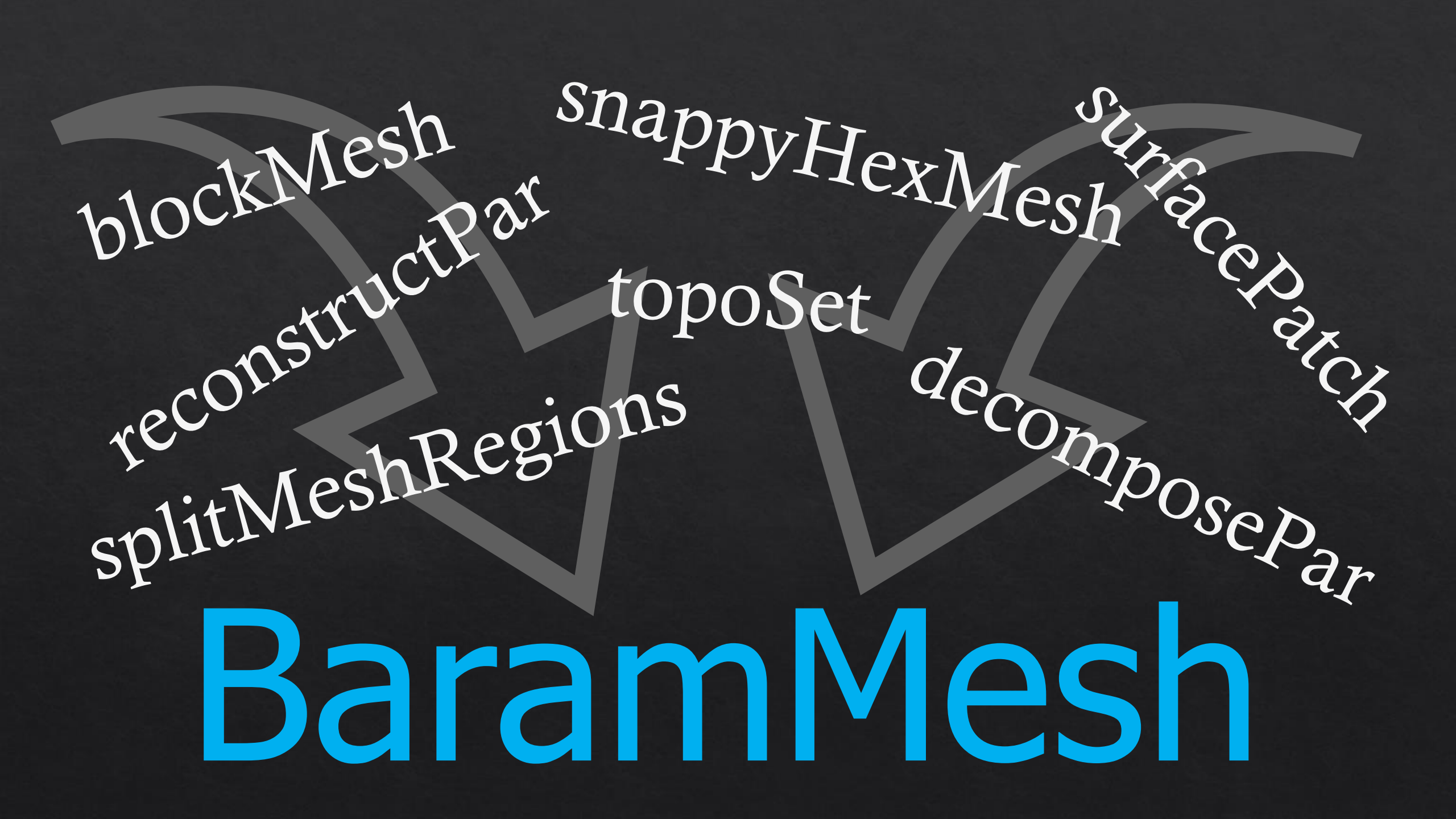
surfacePatch

reconstructPar

topoSet

splitMeshRegions

decomposePar

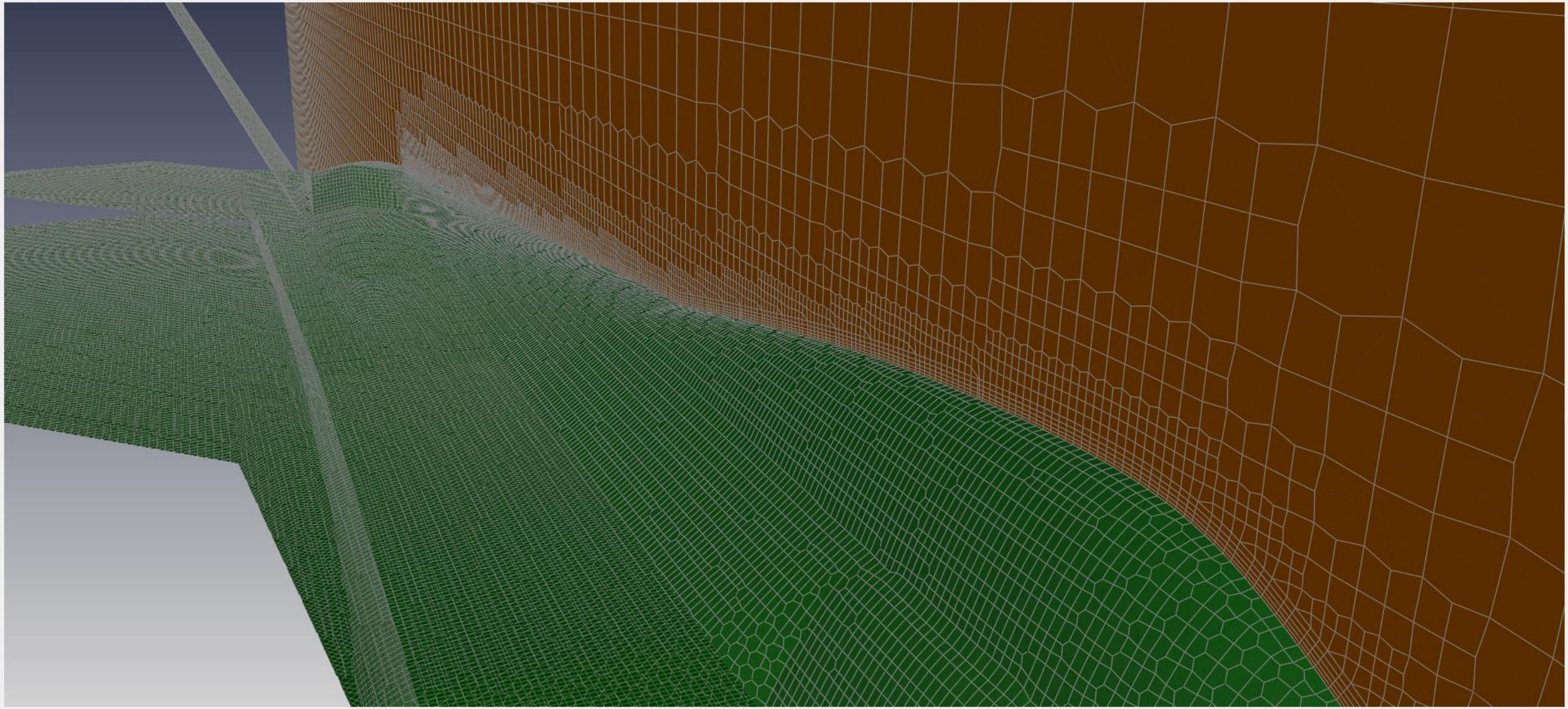

blockMesh
snappyHexMesh
surfacePatch
reconstructPar
topoSet
splitMeshRegions
decomposePar
BaramMesh

BaramMesh - C:\Users\jakej\Documents\tmp\baramSnappyProjects\SU27

File Mesh Quality View Parallel Settings Help

1. Geometry > 2. Region > 3. Base Grid > 4. Castellation > 5. Snap > 6. Boundary Layer > 7. Export

2D

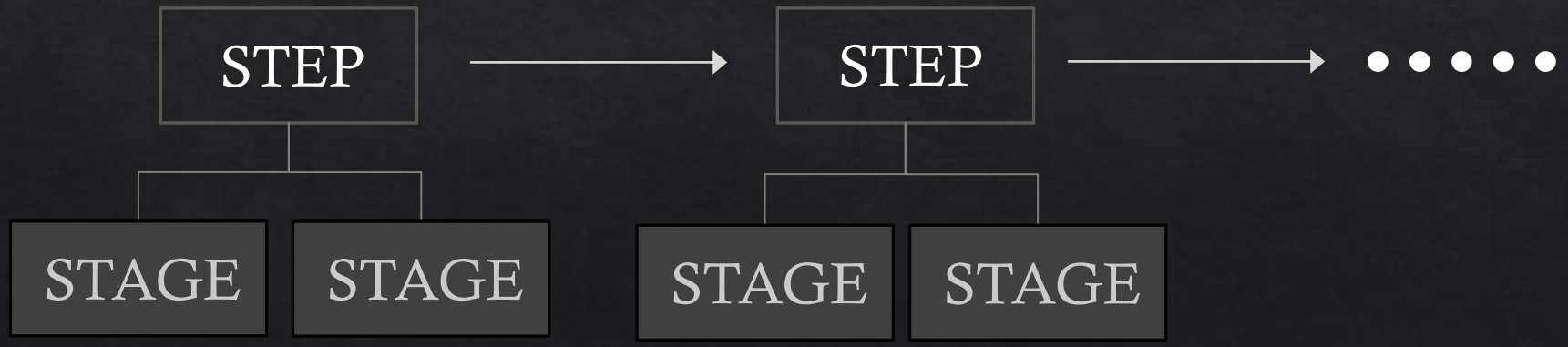


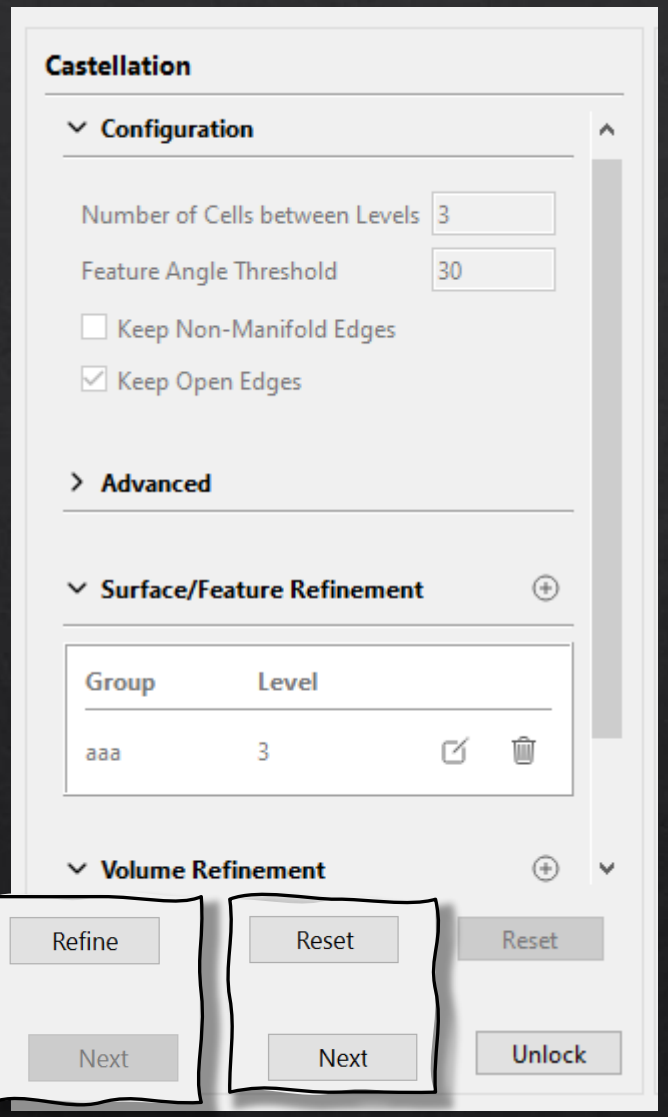
Seven Steps

1. Geometry
2. Region
3. Base Grid
4. Castellation
5. Snap
6. Boundary Layer
7. Export

Organization

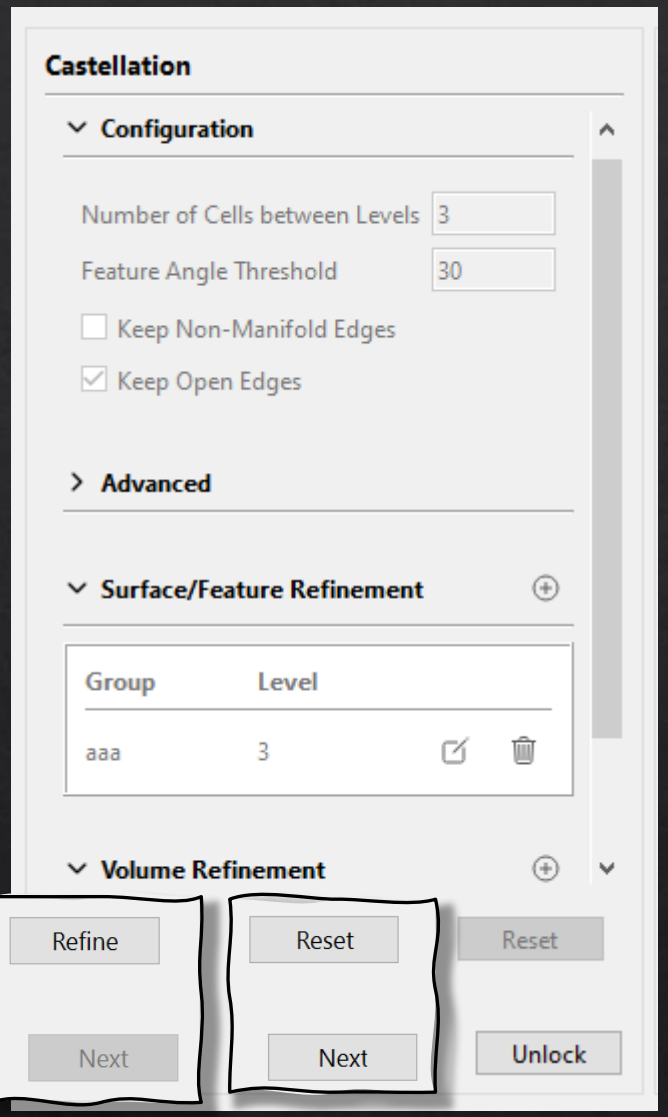
- Several ***Steps*** to generate Final mesh
- Two ***Stages***(pre, post) in each Step





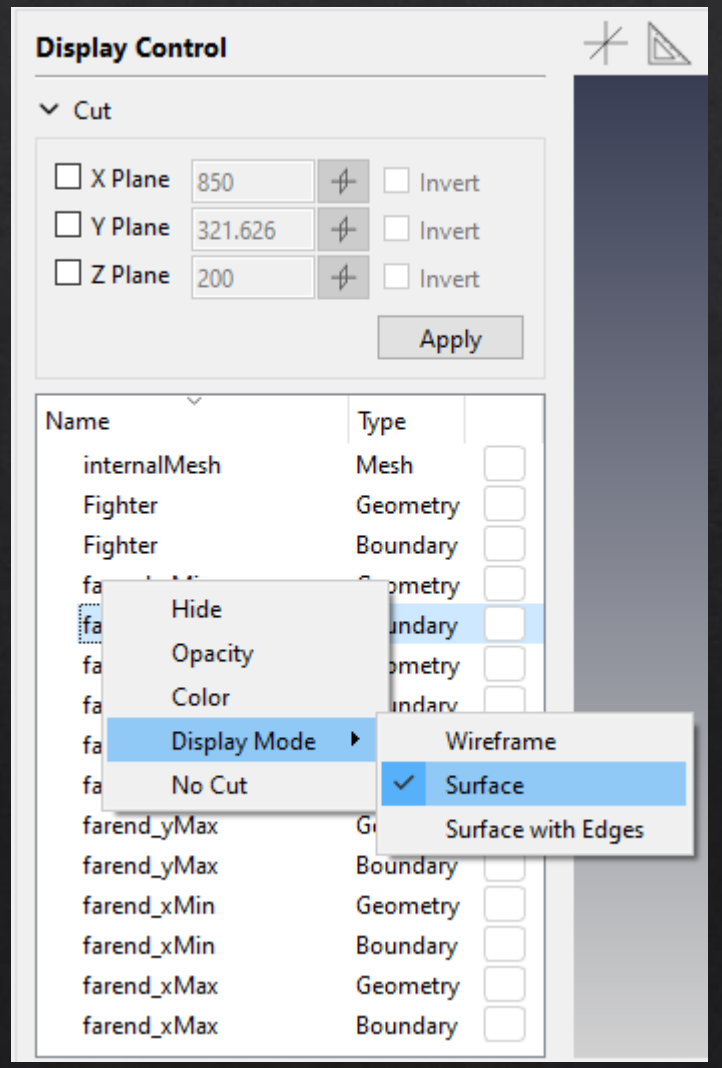
Locking

- Each Step is locked on proceeding to the next step
- A step needs to be unlocked to change configuration in the step
- ***Reset*** removes the mesh generated in a step (i.e. move to former stage in the step)



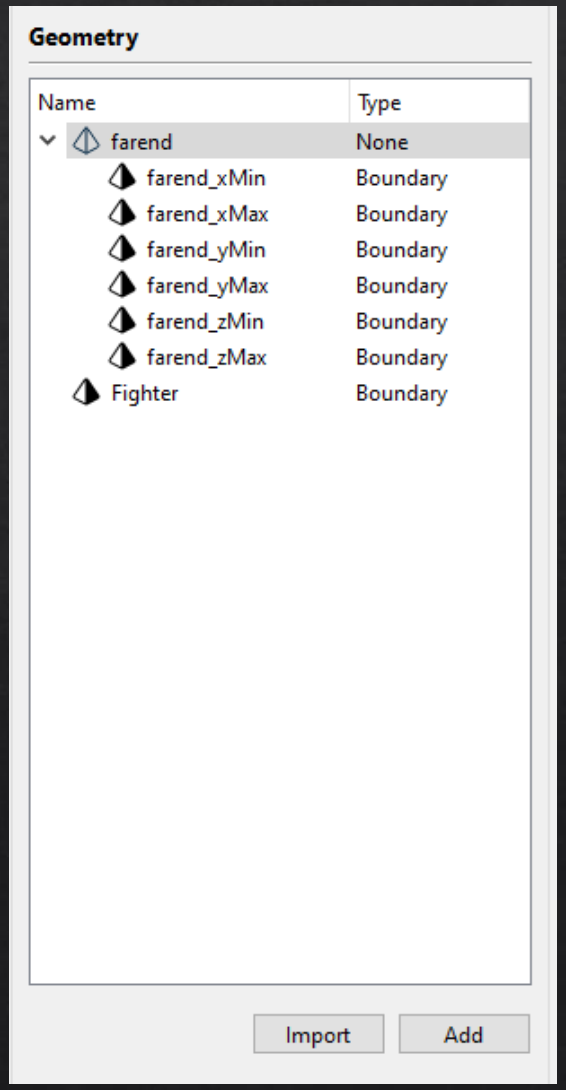
Display Control

- Cross-section view by cutting
- Per Boundary/Geometry control
  - Hide / Show
  - Opacity
  - Color
  - Display Mode
  - “No Cut”



Geometry

- Import STL surface files
- Add Simple Geometries (Hex, Cylinder, Sphere)



Geometry

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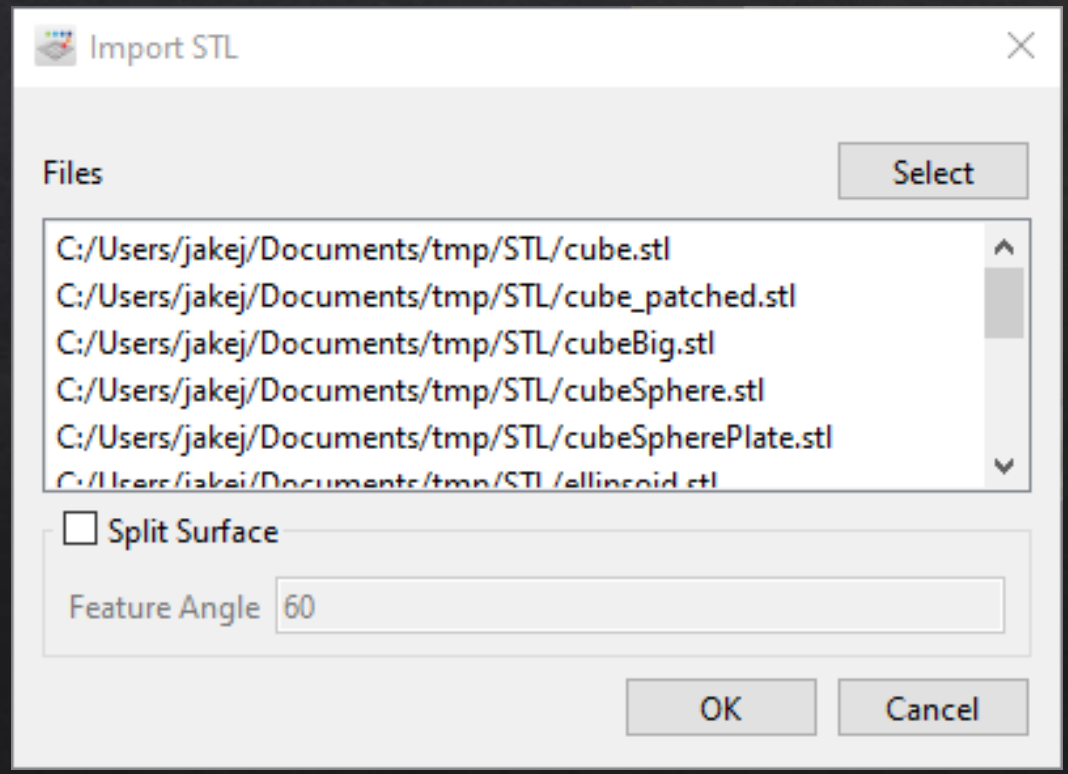
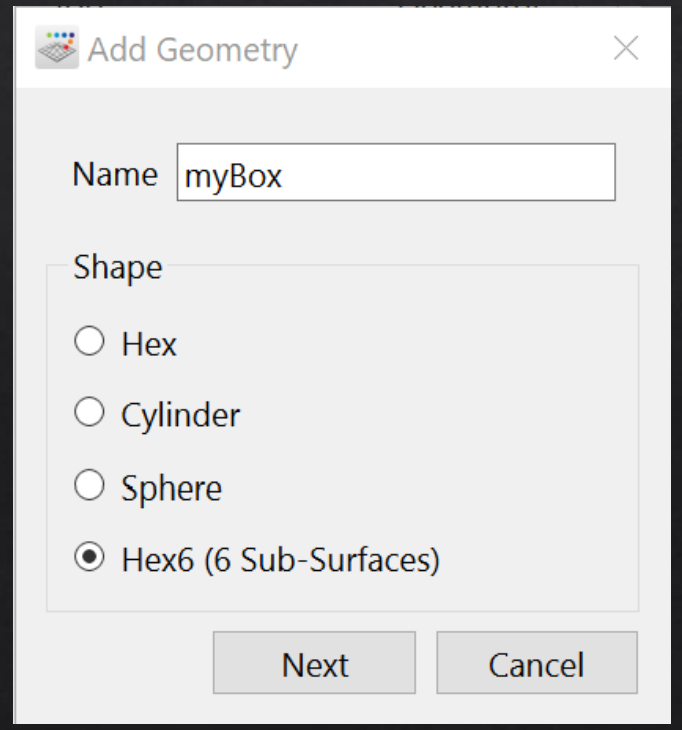
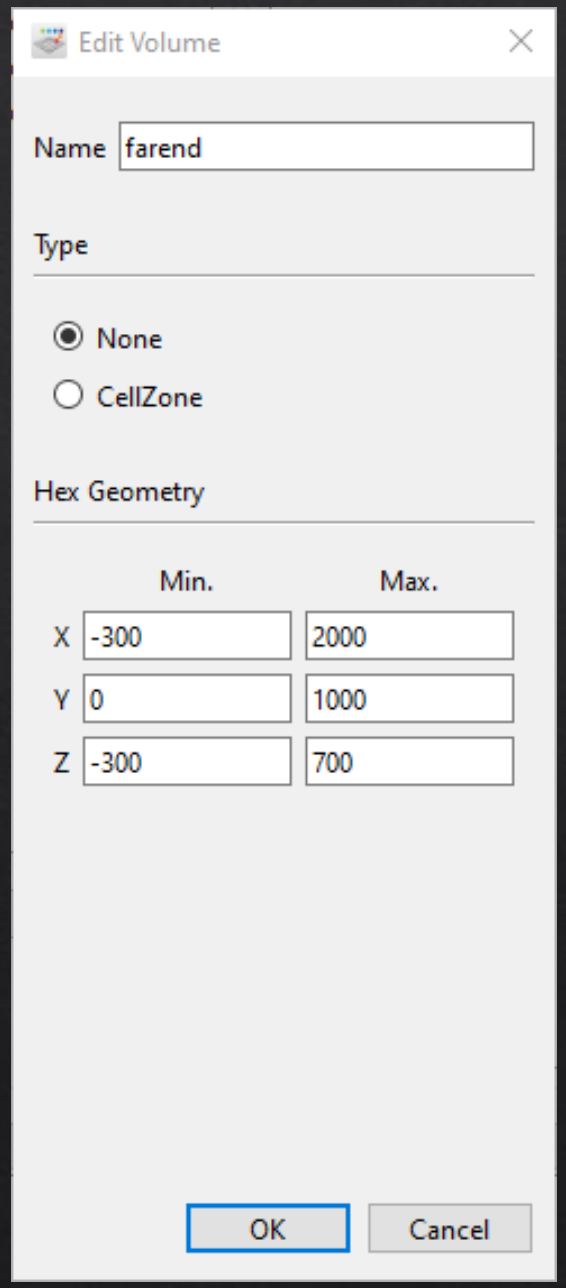


Geometry

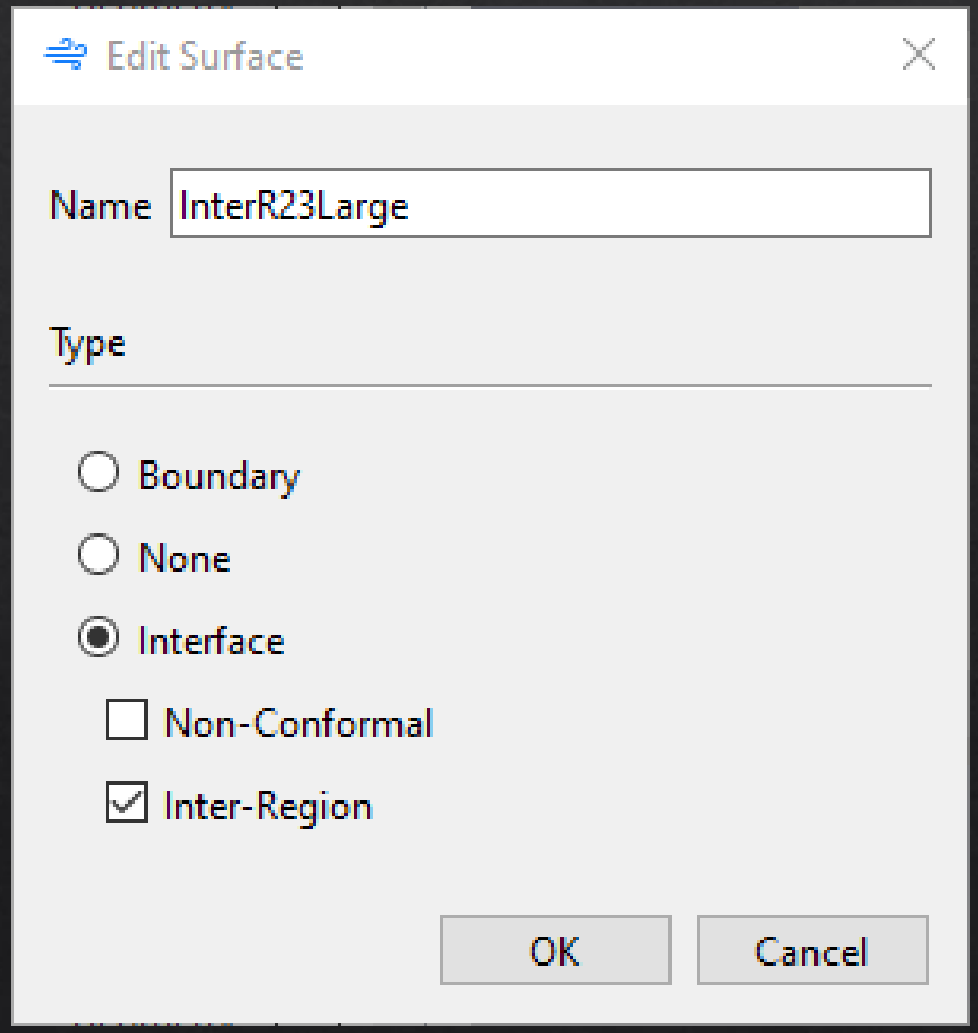
- Import STL surface files
- Add Simple Geometries (Hex, Cylinder, Sphere, Hex6)





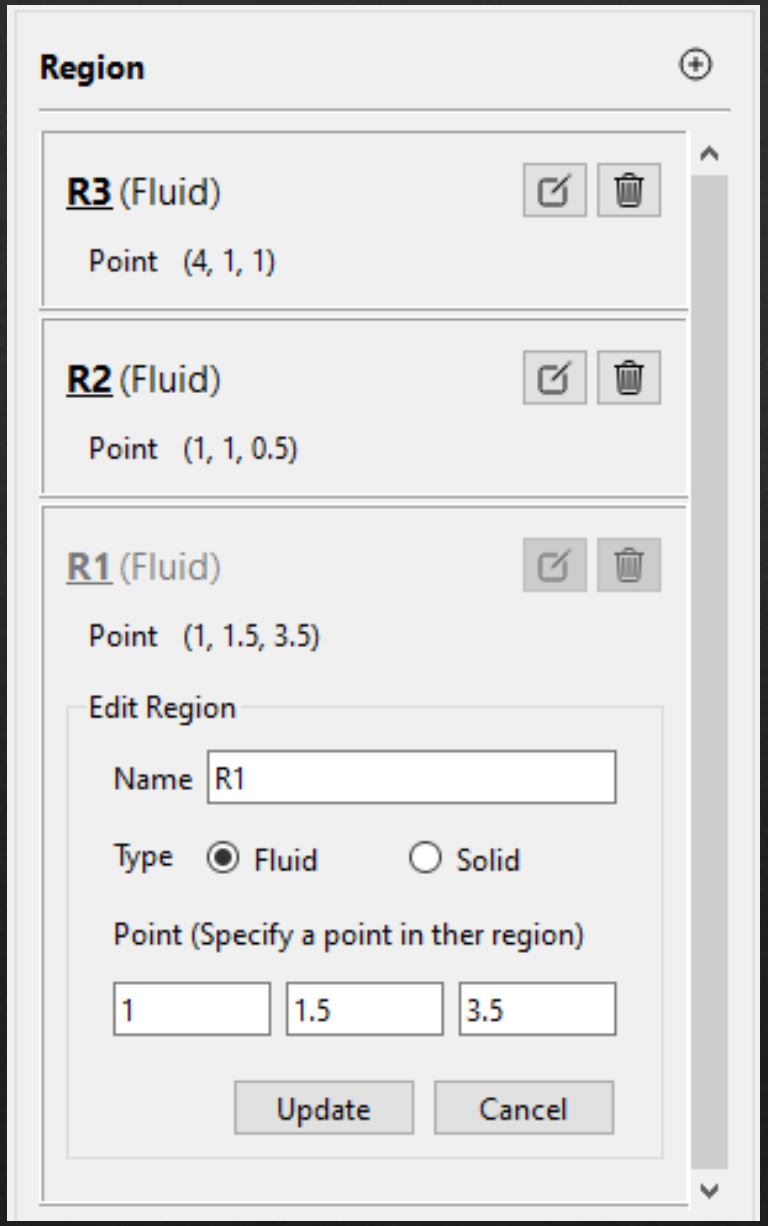
Surface Types

- Each Surface can be assigned to a Boundary, an Interface or None.
- **Inter-region Interface** needs to be designated by user



Region Points

- Case should have one ***Region*** at least



BaramMesh - C:\Users\jakej\Documents\tmp\baramSnappyProjects\SU27

File Mesh Quality View Parallel Settings Help

1. Geometry > 2. Region > 3. Base Grid > 4. Castellation > 5. Snap > 6. Boundary Layer > 7. Export

Region

air (Fluid)

Point (61.8844, 540.701, 123.92)

Edit Region

Name air

Type (•) Fluid ( ) Solid

Point (Specify a point in ther region)

61.8844 540.701 123.92

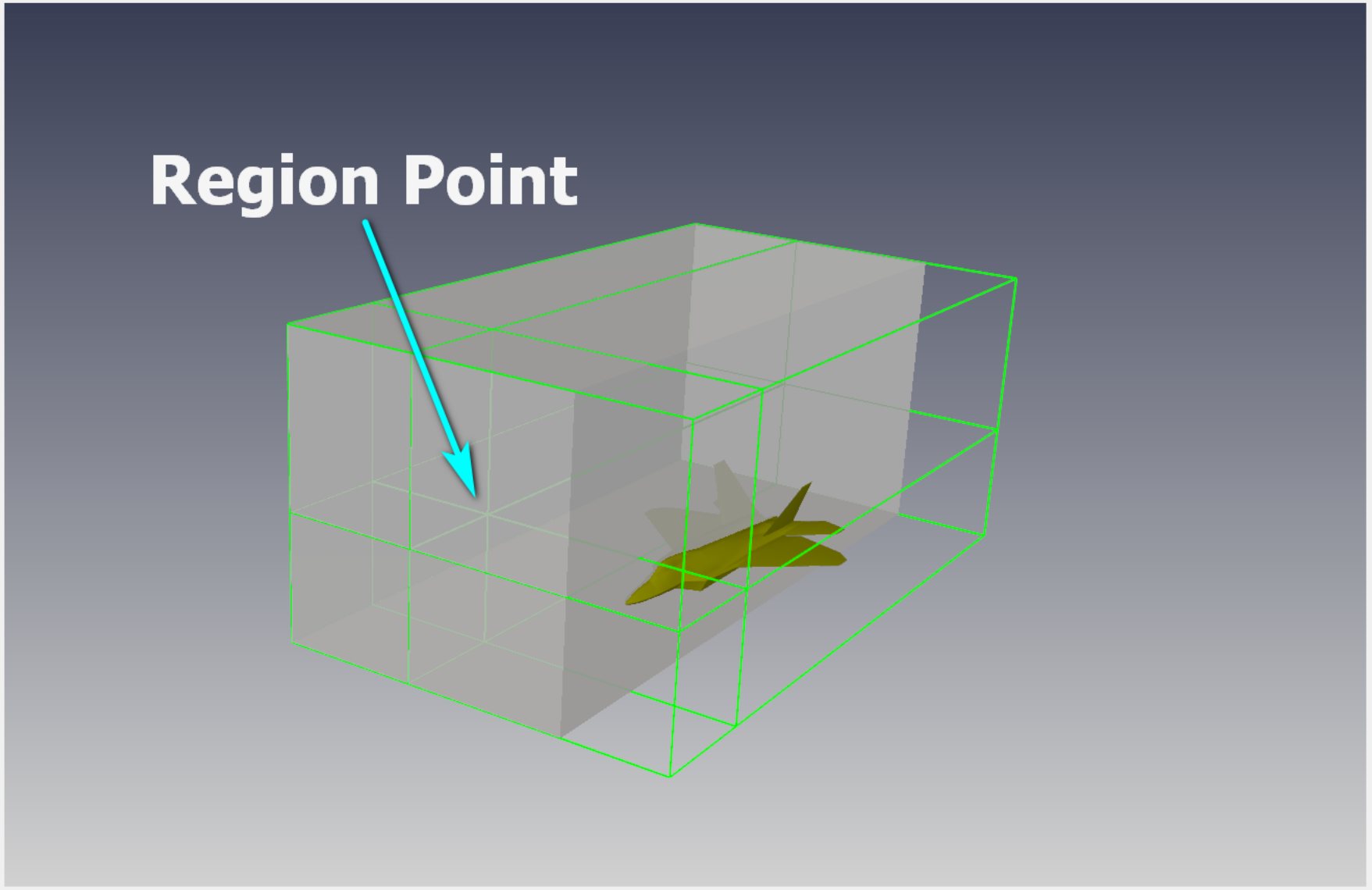
Update Cancel

Next

Display Control

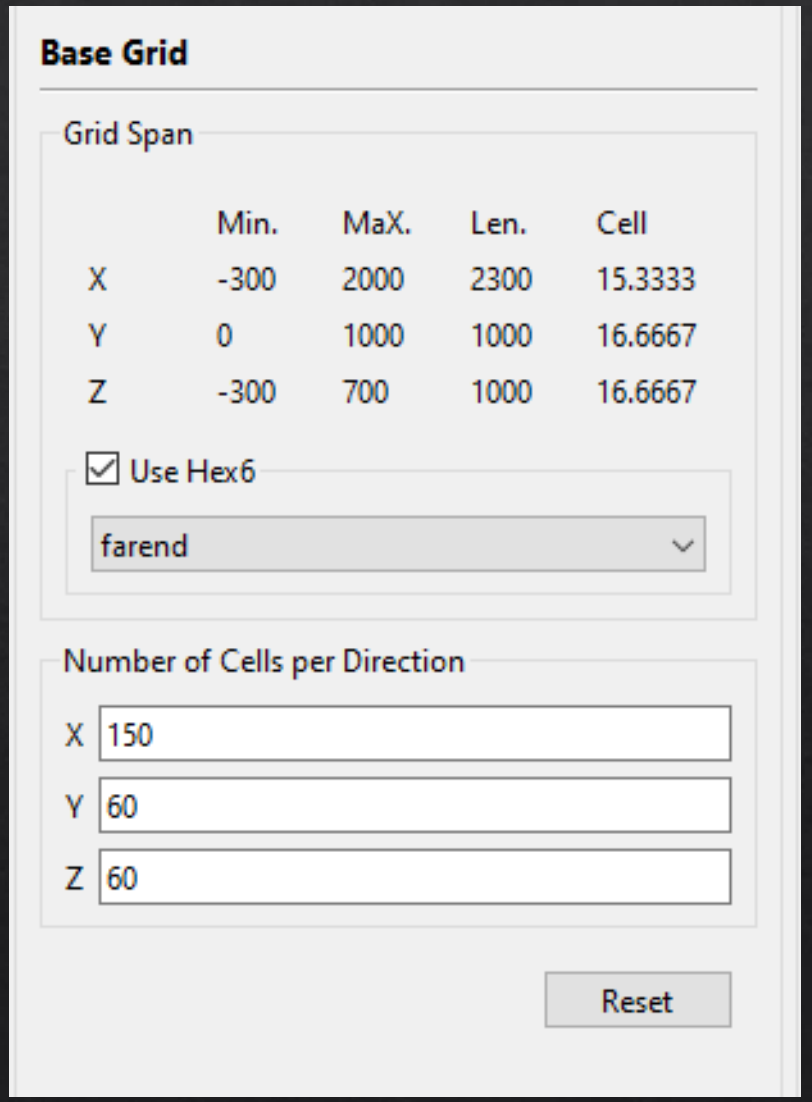
Name	Type
Fighter	Geometry
farend_zMin	Geometry
farend_zMax	Geometry
farend_yMin	Geometry
farend_yMax	Geometry
farend_xMin	Geometry
farend_xMax	Geometry

2D



Base Grid

- Automatic bounding box Calculation
- Hex6 designated as bounding box



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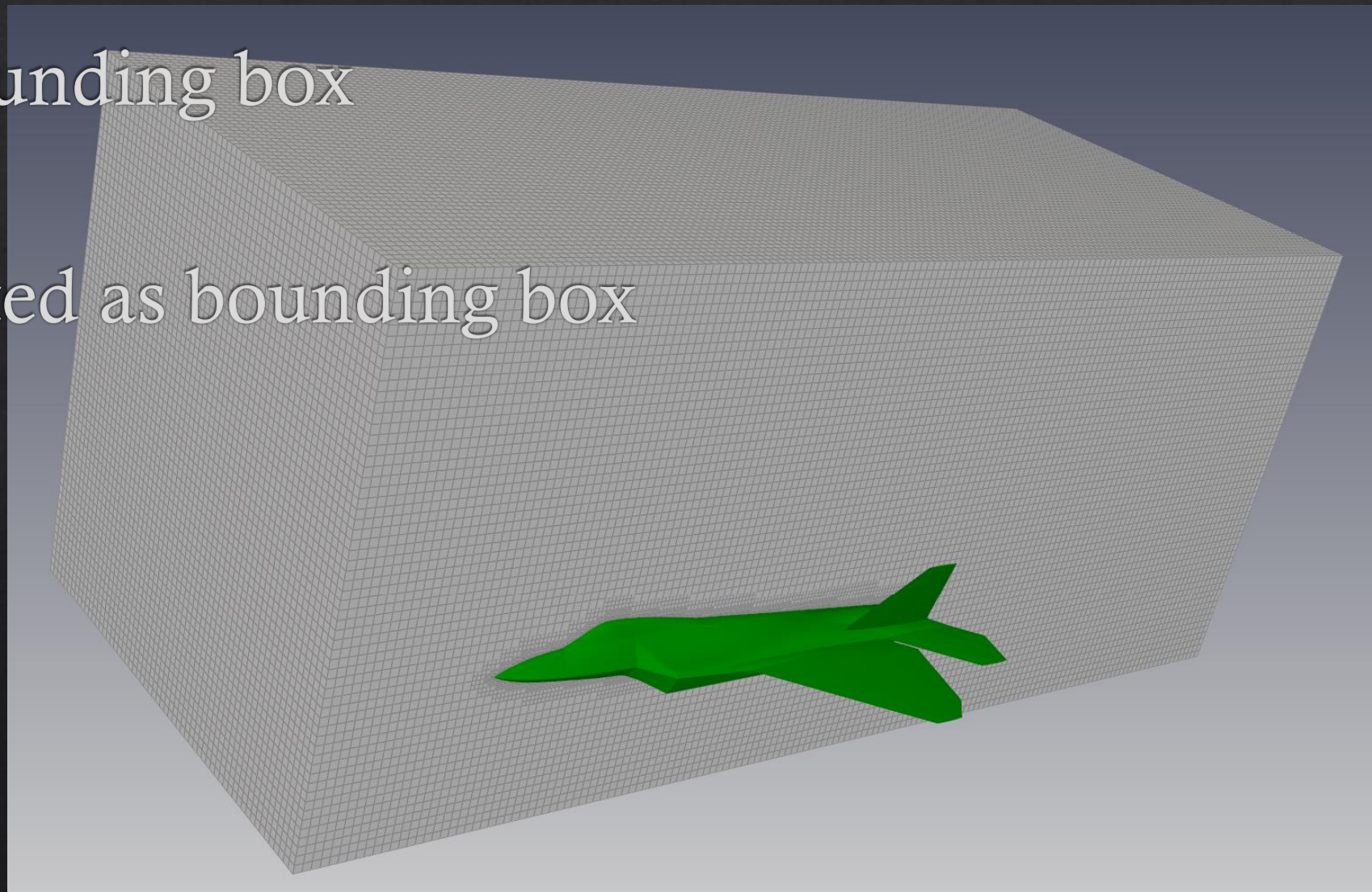
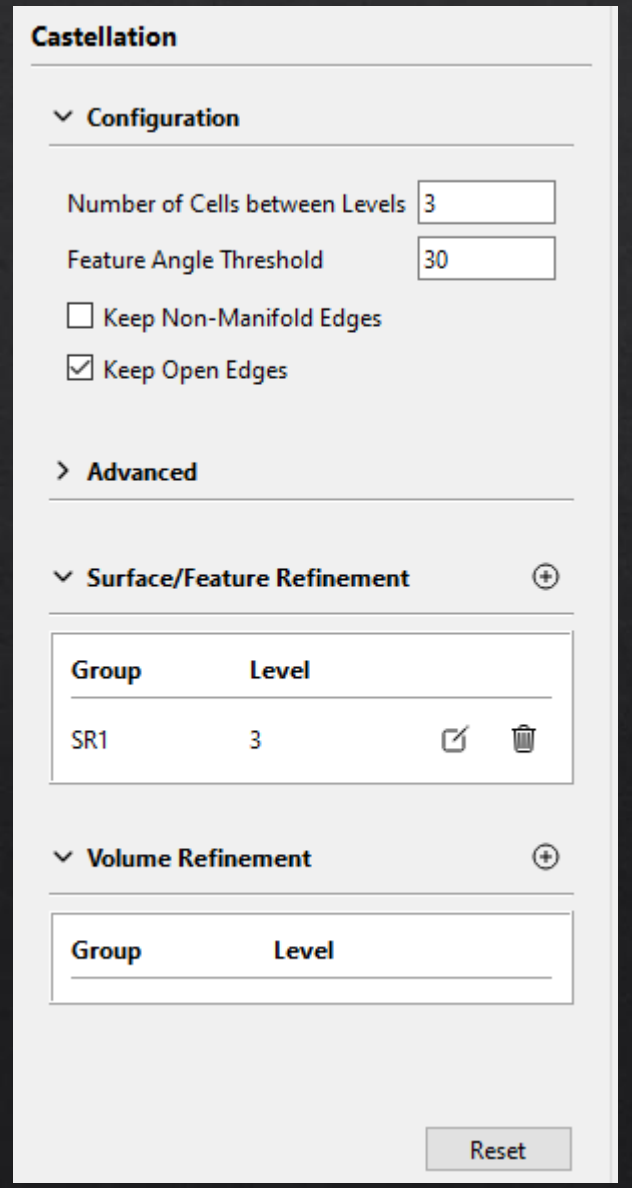
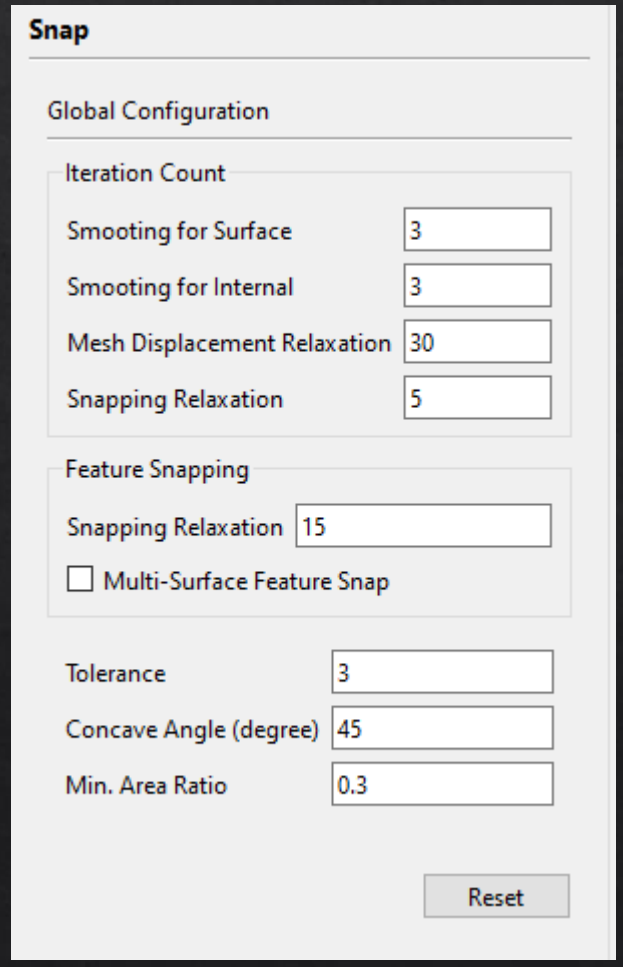


Castellation

- Surface, Feature Edge based refinement
- Volume based refinement



Snap


Snap
Global Configuration
Iteration Count
Smooting for Surface
3
Smooting for Internal
3
Mesh Displacement Relaxation
30
Snapping Relaxation
5
Feature Snapping
Snapping Relaxation
15
Multi-Surface Feature Snap
Tolerance
3
Concave Angle (degree)
45
Min. Area Ratio
0.3
Reset

Boundary Layer Addition

- Global Configuration
- Configuration per Boundary Group

BaramMesh - C:\Users\jakej\Documents\tmp\baramSnappyProjects\SU27

File Mesh Quality View Parallel Settings Help

1. Geometry > 2. Region > 3. Base Grid > 4. Castellation > 5. Snap > 6. Boundary Layer > 7. Export

Boundary Layer

Configurations

Group	Layers
surfaces	5

Advanced Configuration

Number of Grow: 0

Starting Anaylysis
- Feature Angle Threshold: 120
- Max. Thickness Ratio: 0.5

Patch Displacement Smoothing
- Number of Iterations: 1
- Smooth Layer Thickness: 10

Medial Axis
- Min. Axis Angle: 90
- max Thickness Ratio: 0.3
- Number of Smoothing Iter.: 3
- Slip Feature Angle: 30
- Max. Snapping Relaxation Iter.: 10

Mesh Shrinking
- Num. of Buffer Cells: 0
- Max. Layer Addition Iter.: 50
- Max. Iter. Before Relax: 20

Reset

Next

Display Control

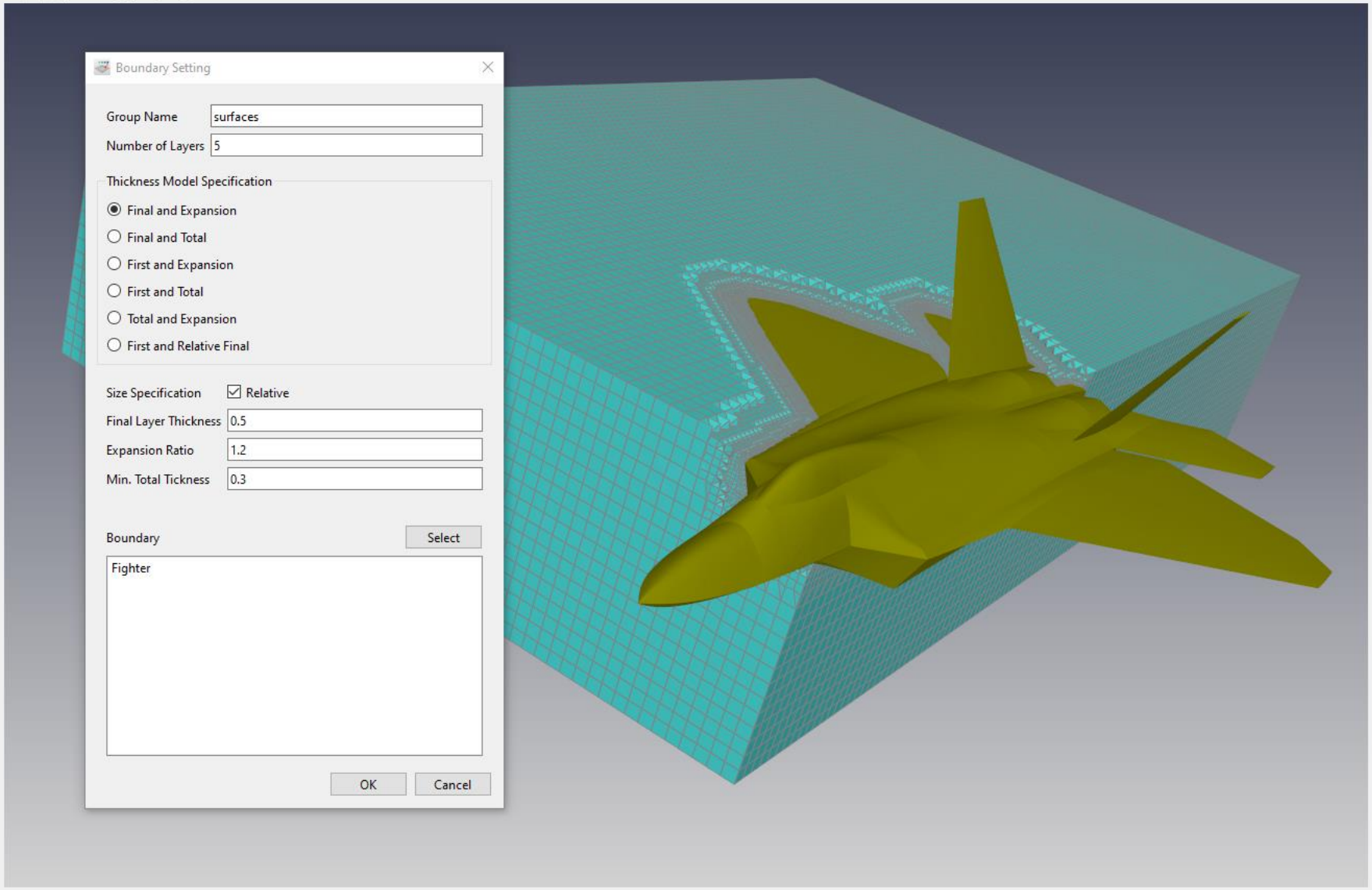
Cut

- X Plane 302.381 Invert
- Y Plane 321.626 Invert
- Z Plane 1.60425 Invert

Apply

Name	Type
internalMesh	Mesh
Fighter	Geometry
Fighter	Boundary
farend_zMin	Geometry
farend_zMin	Boundary
farend_zMax	Geometry
farend_zMax	Boundary
farend_yMin	Geometry
farend_yMin	Boundary
farend_yMax	Geometry
farend_yMax	Boundary
farend_xMin	Geometry
farend_xMin	Boundary
farend_xMax	Geometry
farend_xMax	Boundary

2D



Q & A