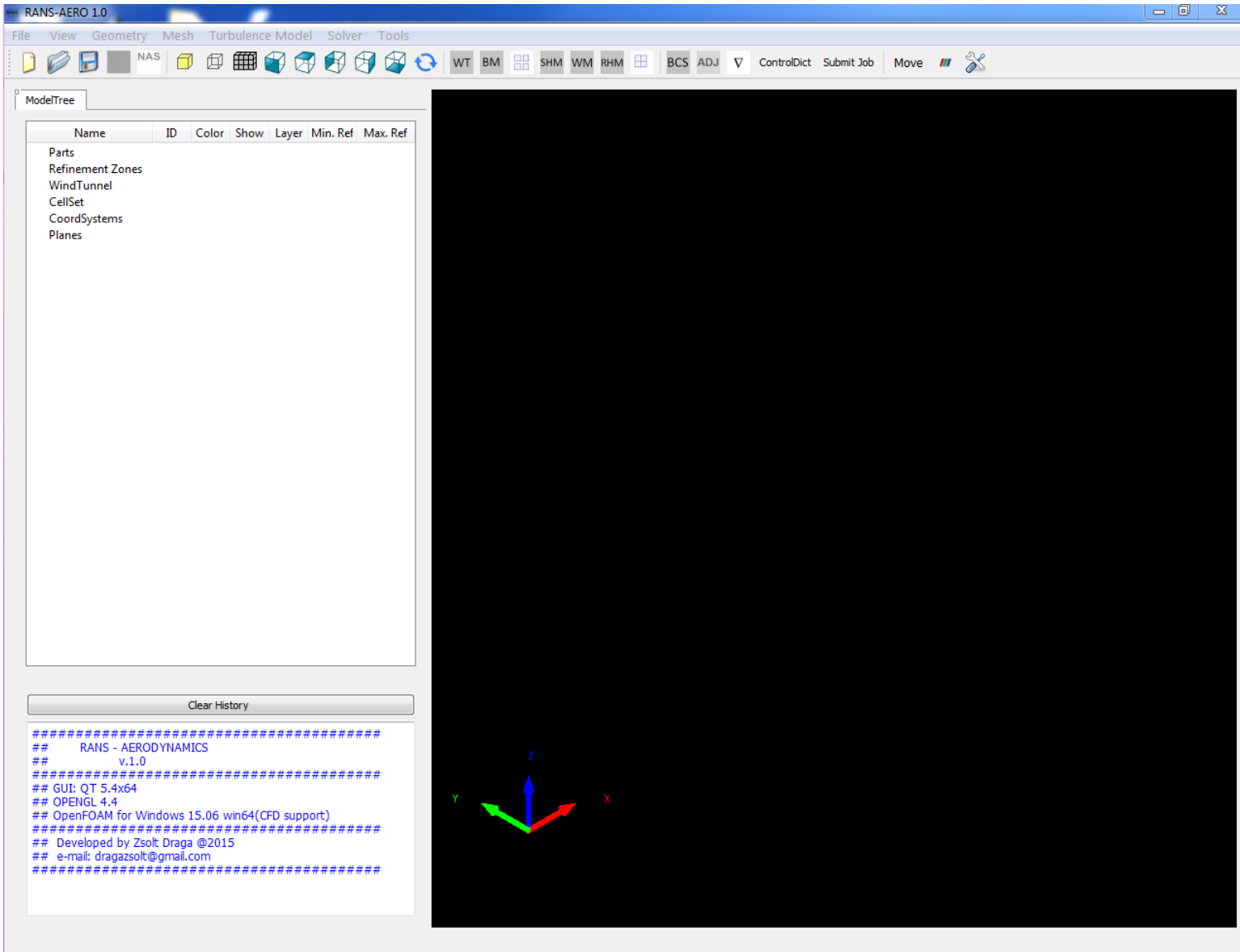


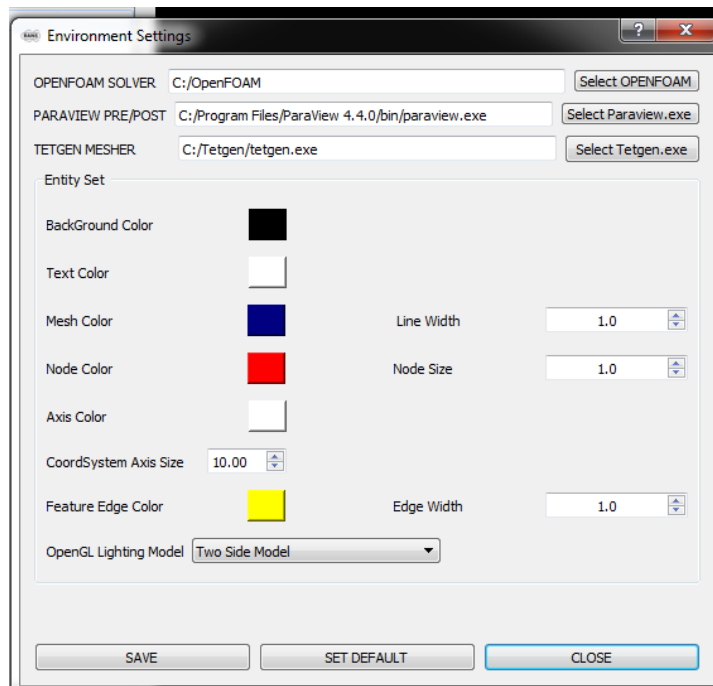
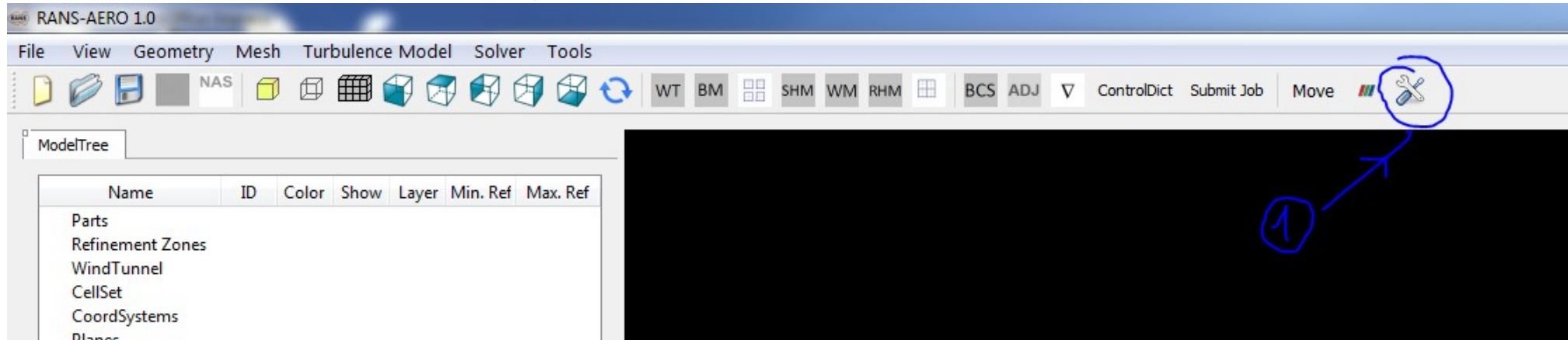
RANS AERO 1.0

32

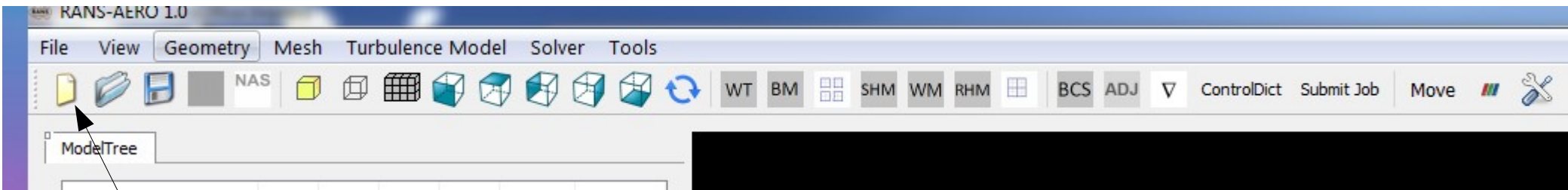


STEP1

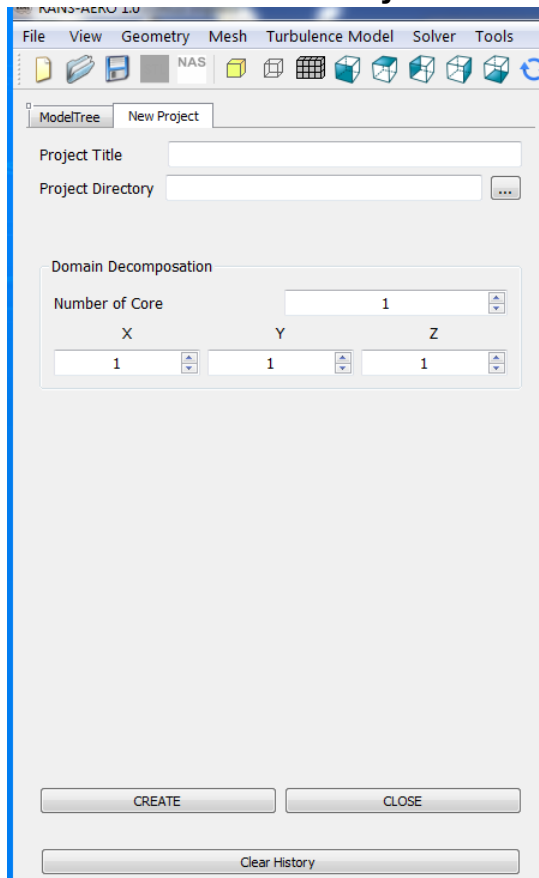
- Environment Settings



Step2 -Let start

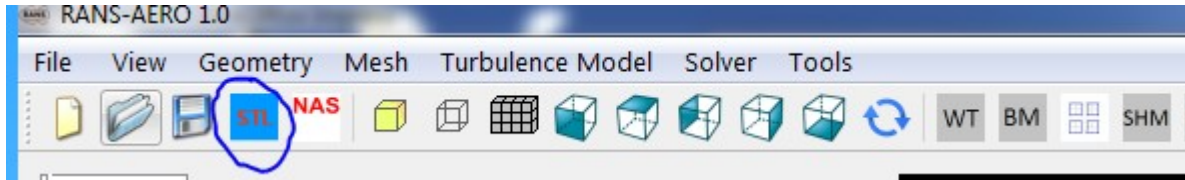


New Project

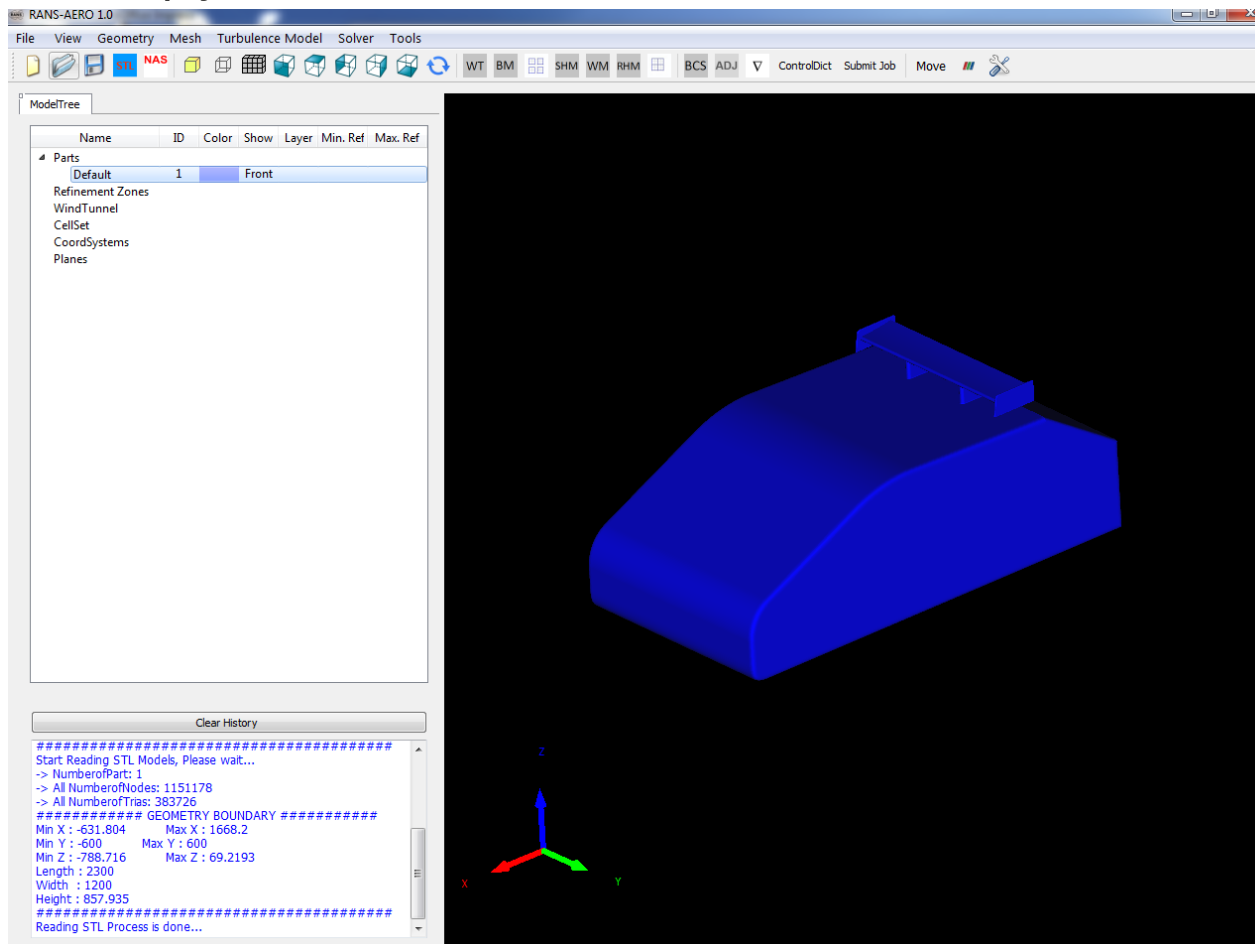


- 1 .Set Project Name
- 2 .Select Project Directory
- 3 .Select Number of CPU core (4, 6, 8)
- 4 .Decomposition of the Domain in x, y, z direction
($x*y*z$ must be equal to Number of Core)
For Example: Number of Core: 8
X= 4 , Y=1, Z=2
- 5 .Create Button – Project Created

Step3 – Read Geometry (STL (ascii) and Nastran file, STL is preferred)

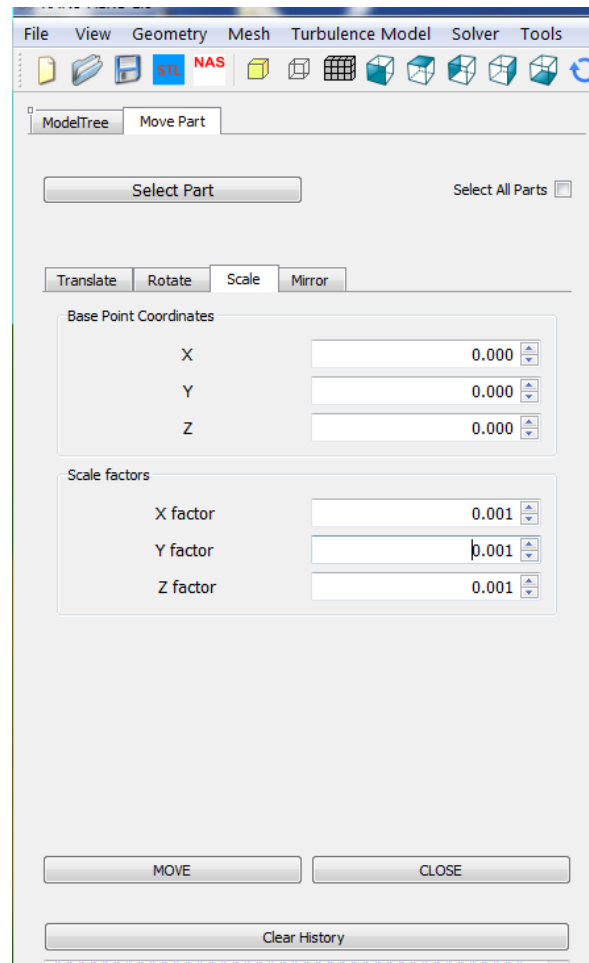
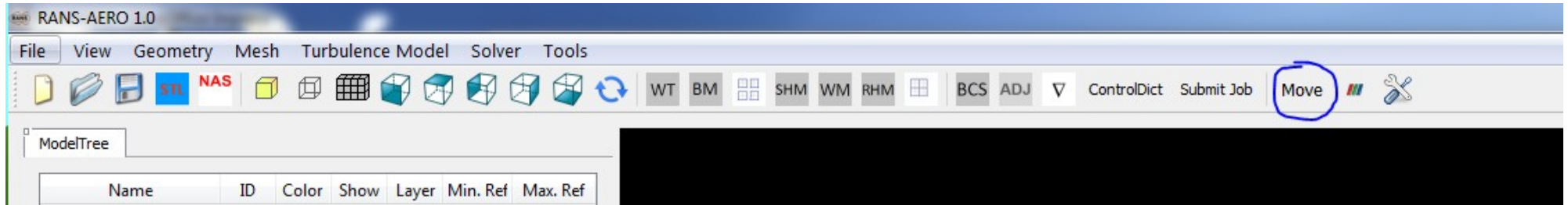


1. Multiply files can be selected



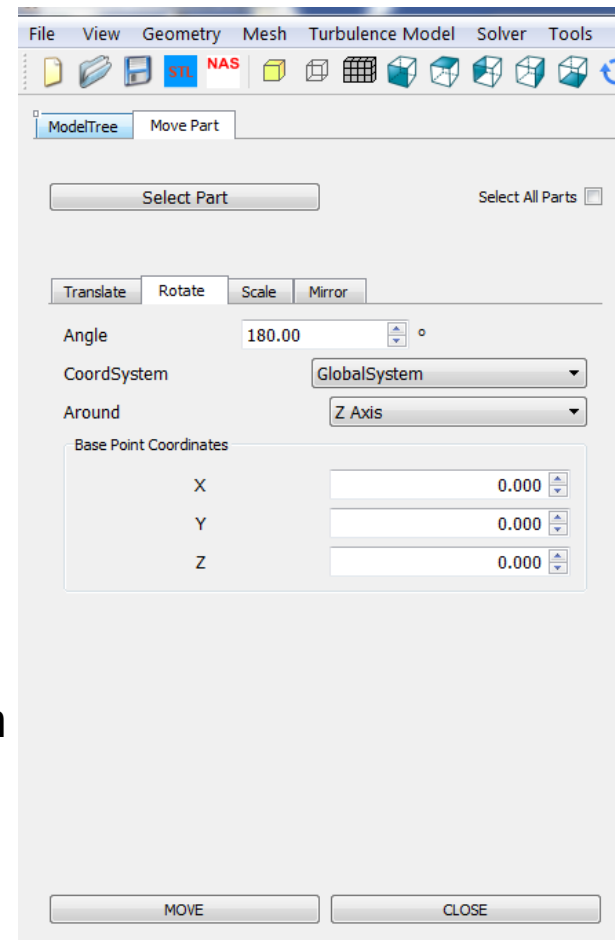
Select Part Name, Right
Click . Change Part
Name

Step4 – Set correct unit system (OPENFOAM – meter, kg, Newton system)

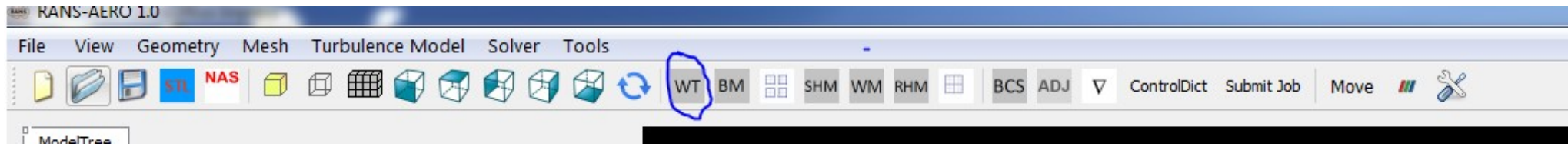


Scale mm to meter

Rotate to right position



Step5 – Create Windtunnel



Reference Point Coordinates [m]

X	Y	Z
0.00	-5.00	0.00

Dimensions[m]

Total Length	Total Width	Total Height
20.0	10.0	6.0

Slip - Ground Length

0.0

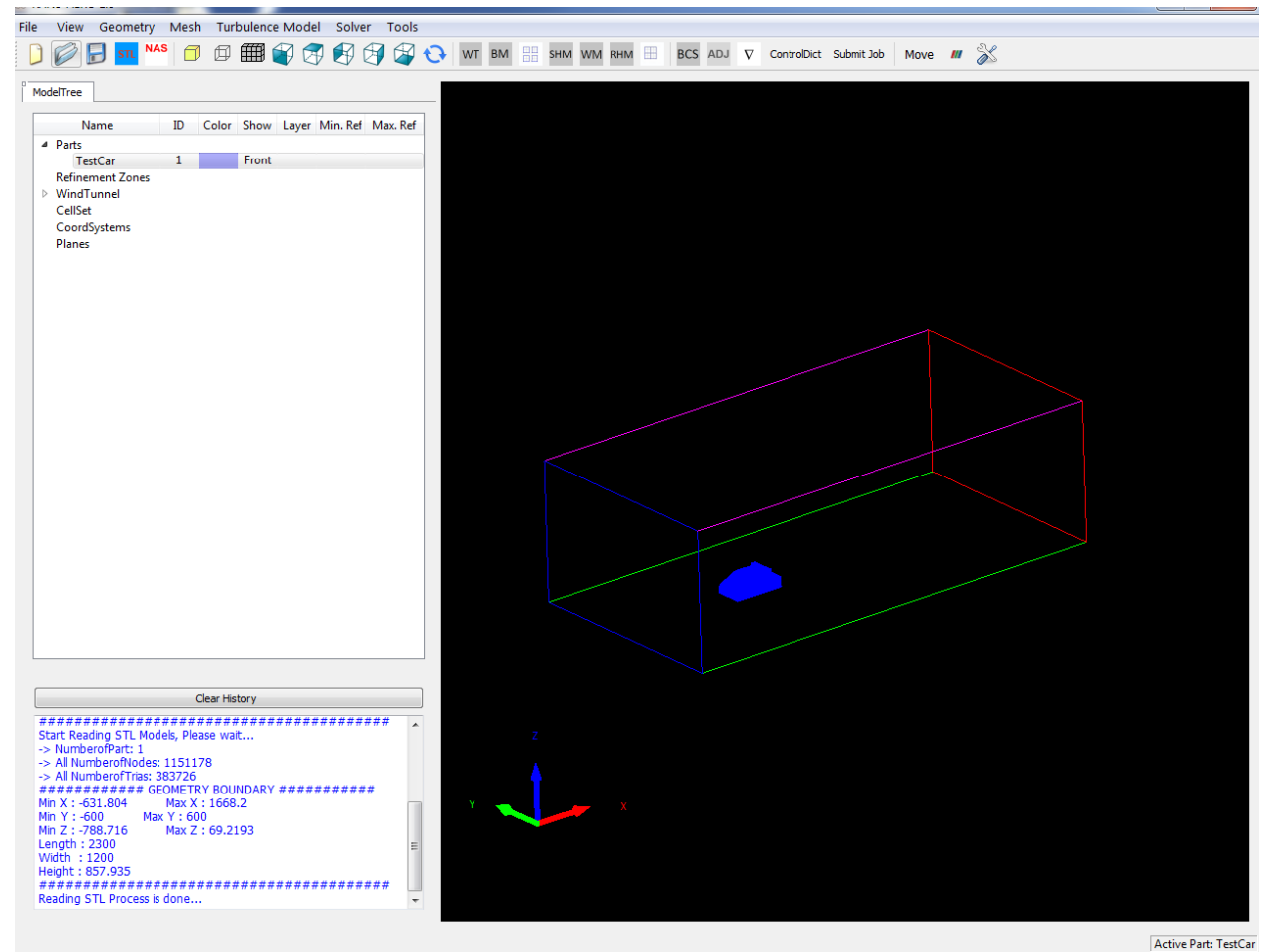
Refinements

NX	NY	NZ
20	10	6

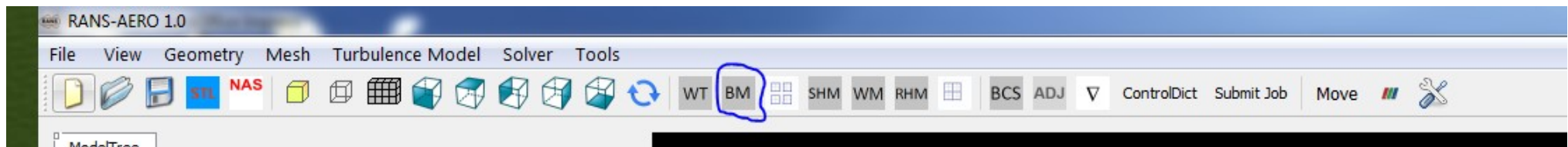
Grad X	Grad Y	Grad Z
1	1	1

Show

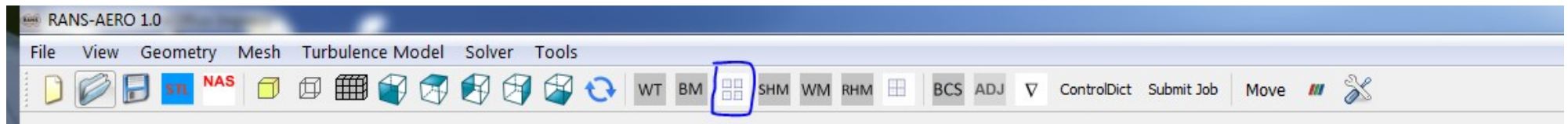
SAVE CLEAR CLOSE



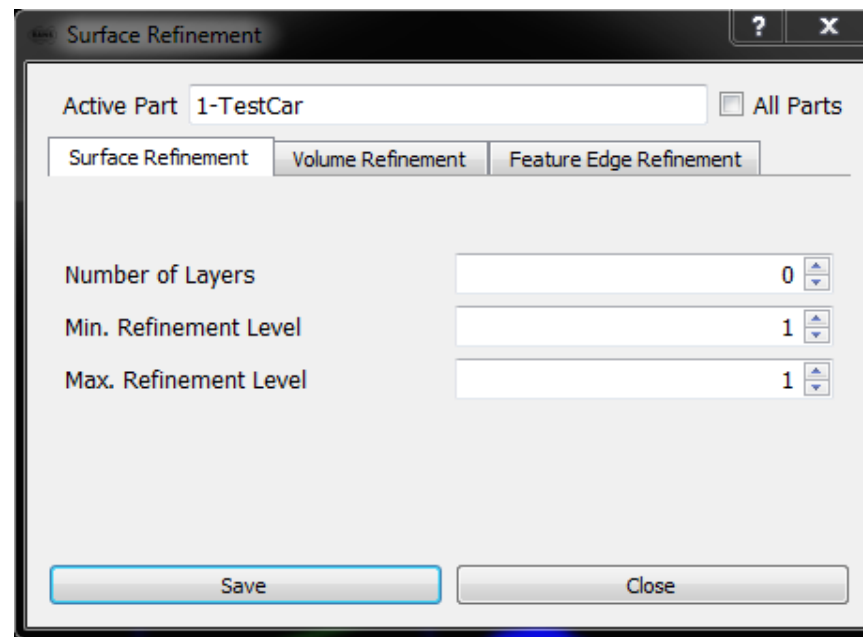
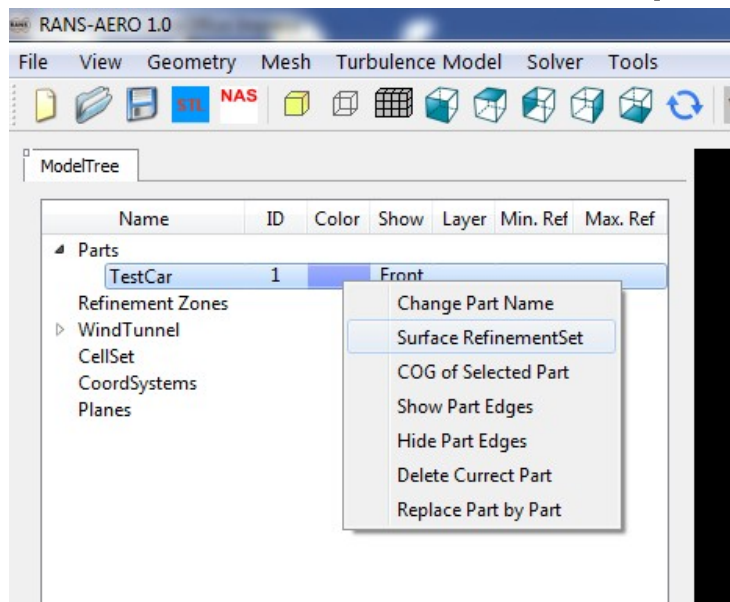
Step6 – BlockMesh (Base Mesh for Octree based snappyhexmesh)



Step7 – Domain decomposition (Distribute Mesh for parallel meshing)

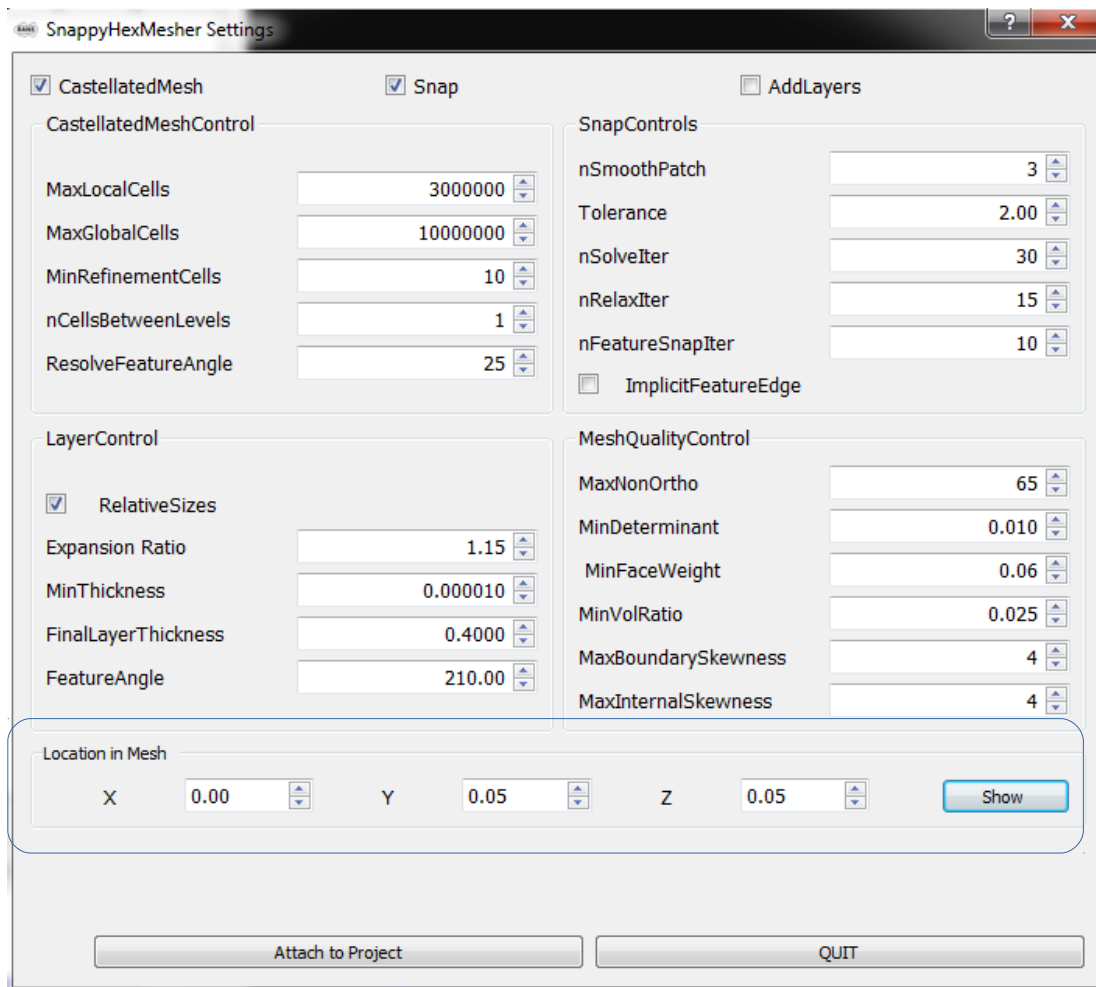
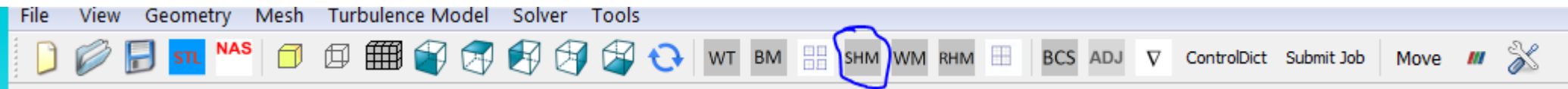


Step8 – Surface RefinementSet



2 refinement

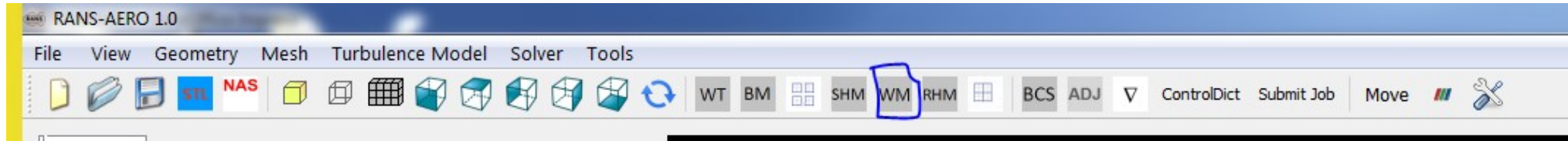
Step9 – SnappyHexmeh (Volume Mesh)



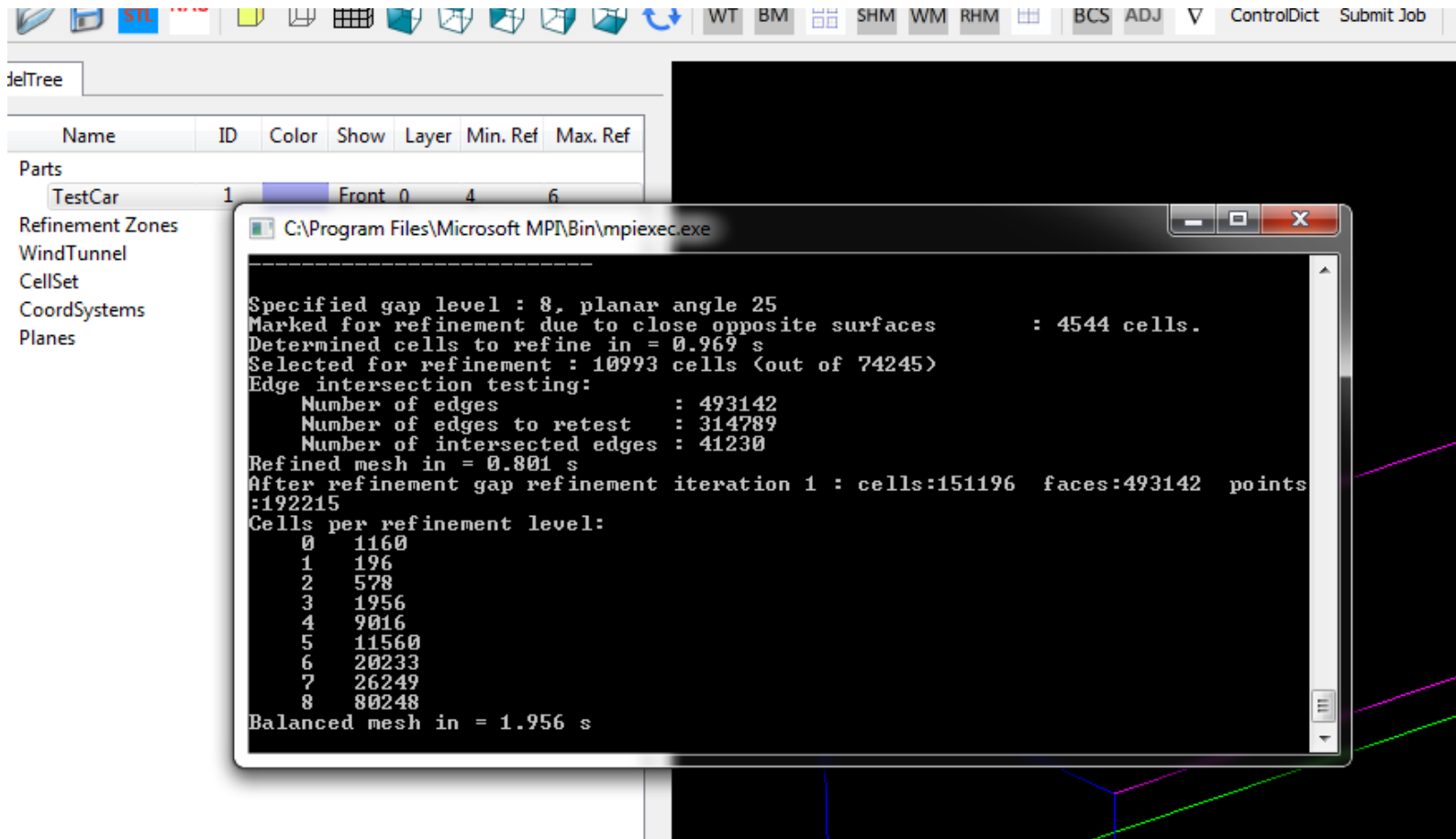
ImplicitFeature Edge should be on

Point must be inside of Windtunnel
and outside from object (external
aerodynamics)

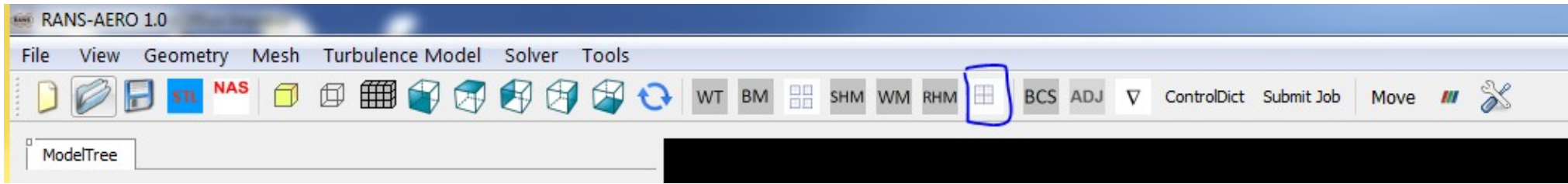
Step10 – Write Snappyfile out



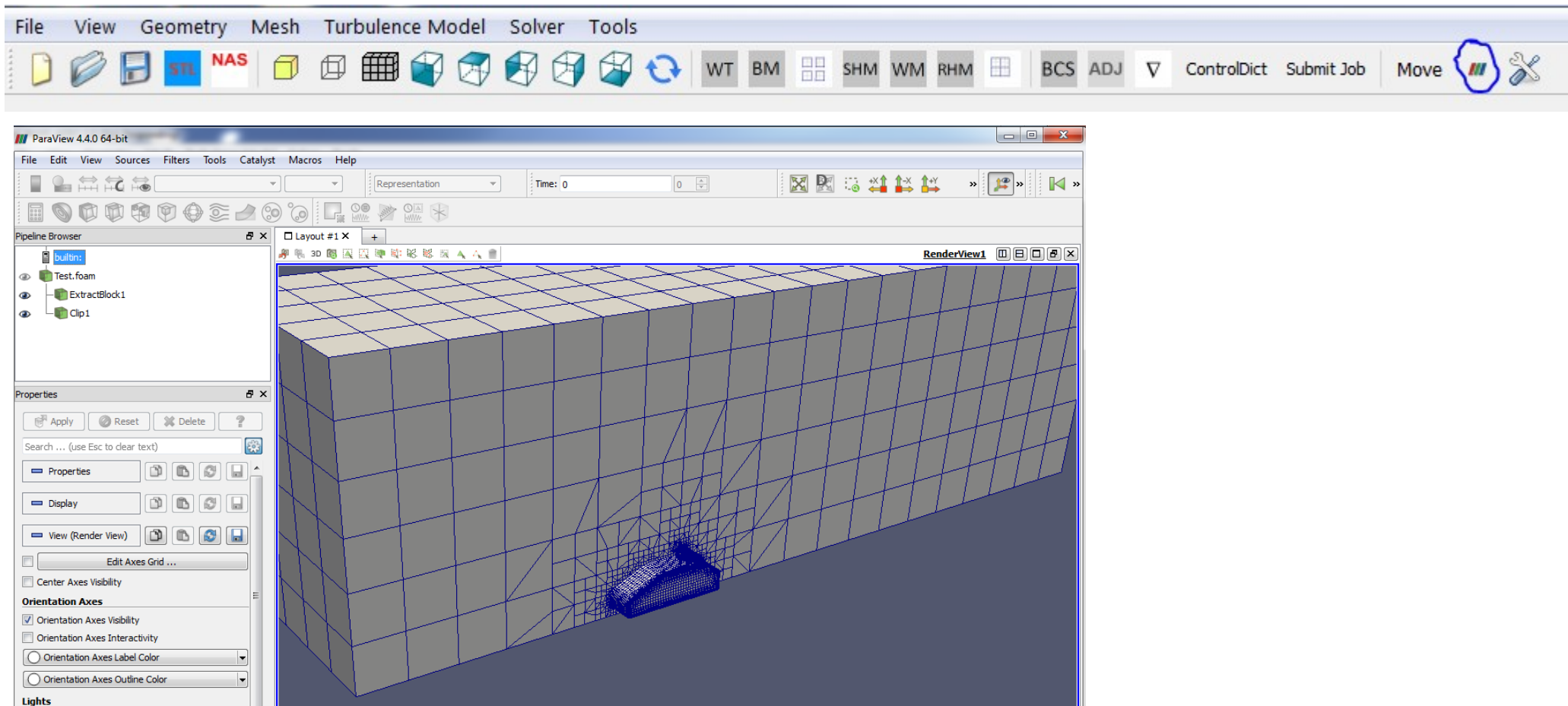
Step11 – Run HexaMesher (it takes from minutes to days) (1.5 million elements 1 GB RAM)



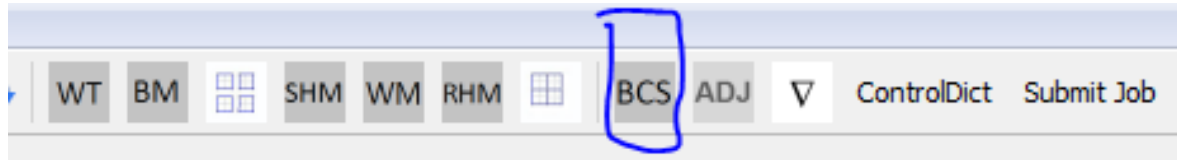
Step12 – Recombine the mesh



Step13 – Check Mesh – Open Paraview



Step13 – Set Turbulence Model



Turbulence Model Setup

Turbulence Model: Solver:

Initialize by: Boundary Layer Thickness [m]:

INLET GROUND And Walls RotationWall Porous Media

Inlet Velocity

X - Velocity [m/s]:

Y - Velocity [m/s]:

Z - Velocity [m/s]:

Inlet Pressure

Initial Gauge Pressure (Pa):

Turbulence

Turbulence Intensity [%]:

Turbulence Length Scale [m]:

Attach to Project Quit

Turbulence Model Setup

Turbulence Model: Solver:

Initialize by: Boundary Layer Thickness [m]:

INLET GROUND And Walls **RotationWall** Porous Media

Static Walls

TestCar

Rotational Walls

Parameters

Omega [1/s]:

Rotation Axes

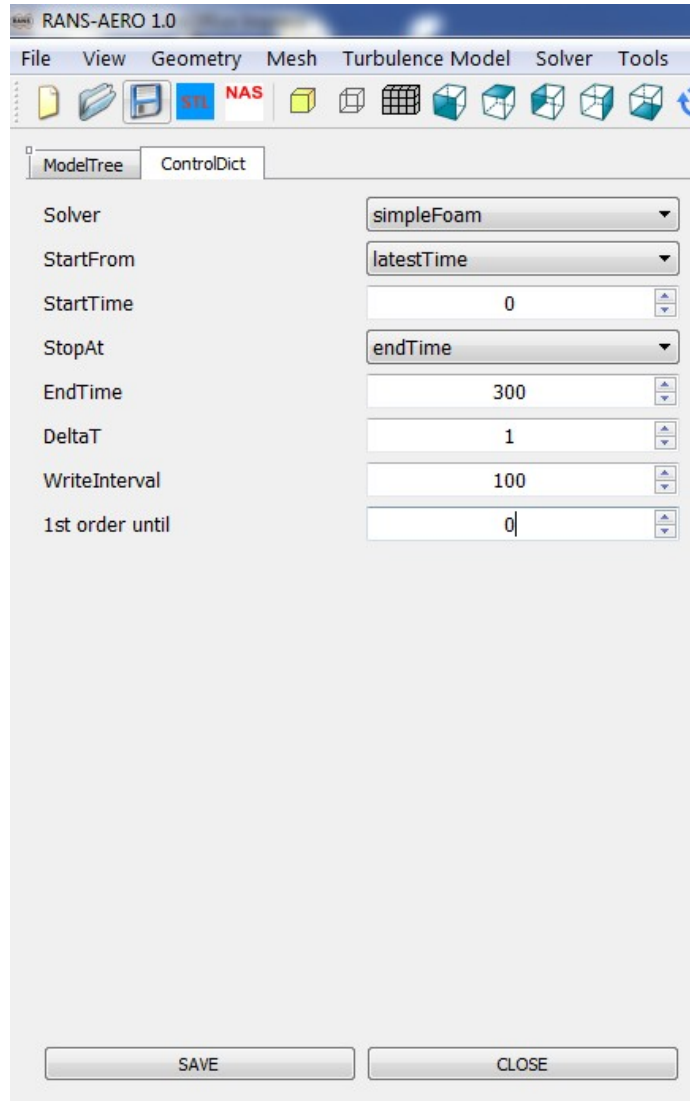
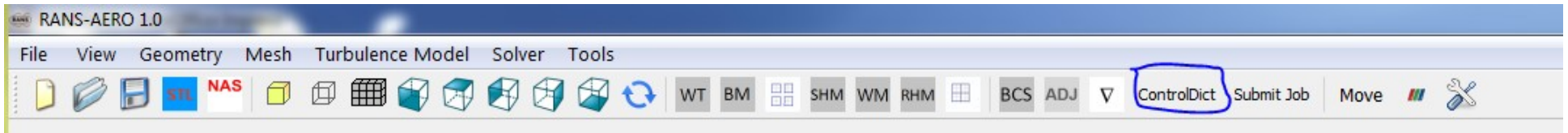
Select CoordSystem ...

X Axis

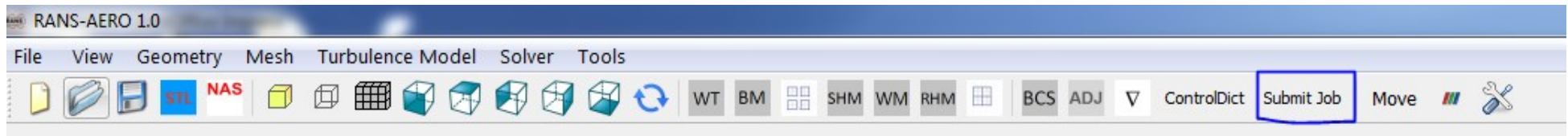
SET Parameters

Attach to Project Quit

Step14 – ControlDict Settings



Step14 – Run Simulation



Step15 – Check Convergence

