PHOENICS

1、首先CAD建模（闭合的PL线——ext拉伸体——union组合体——stlout输出为.stl格式的文件。

注意：**stl**文件名命名要以项目名称命名，且尽量增加可区别的名称（但不能太长），同时也是为区别和其他项目名的重名。

2、打开PHOENICS软件，新建flair模块。

3、导入物体。

4、计算区域：一般进风口边界调为模型大小的1.5倍，出风口边界调为2倍，左、右各1～1.5倍，边界高度调整为实体模型最高高度的3～5倍。

5、设置进出风口。

6、画网格。

7、PHOENICS设置：点击Models：

Energy Equation——Temperature——off；Turbulence models——KEMODL

Comfort indices——settings——Mean Age of Air——on——previous panel;

点击**Sources：Gravitational forces——off**；

点击**Numerices：Total number of iterations**设为**5000**（针对小区）；

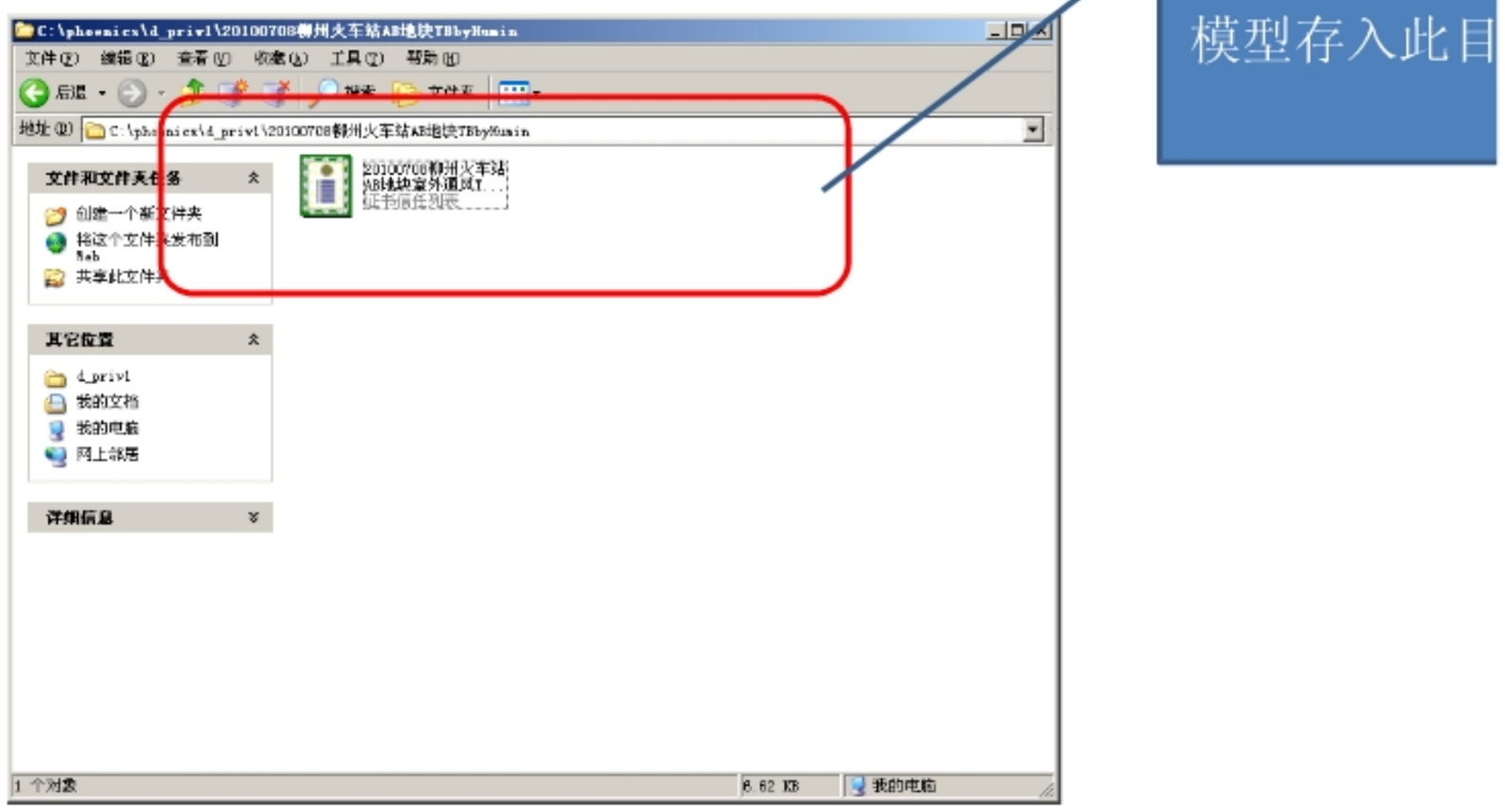
点击**properties**：

点击下图红色位置，出现左边对话框，选中gas——ok——选20度空气－ok－退出即可。

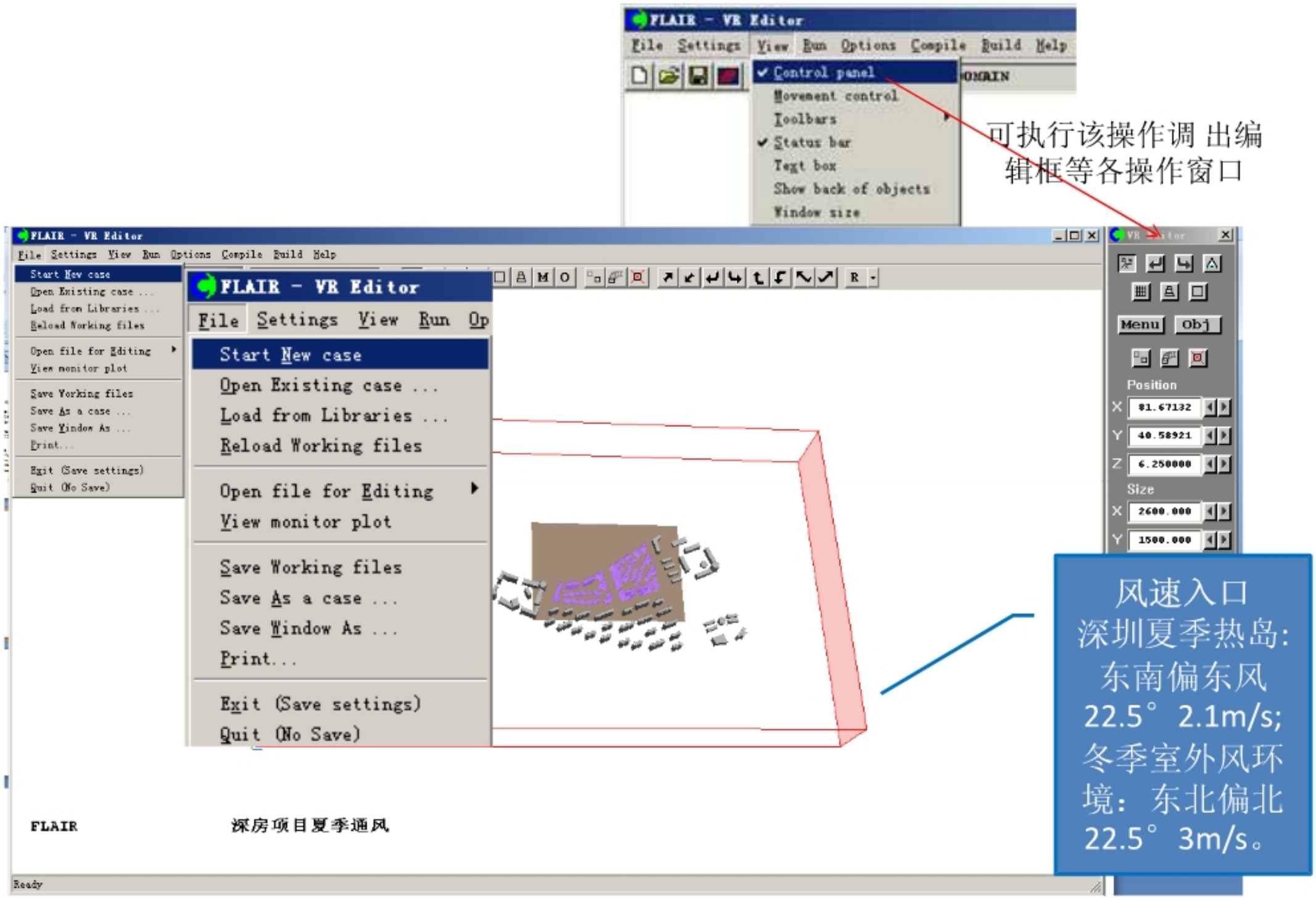
CAD 绘图要点：

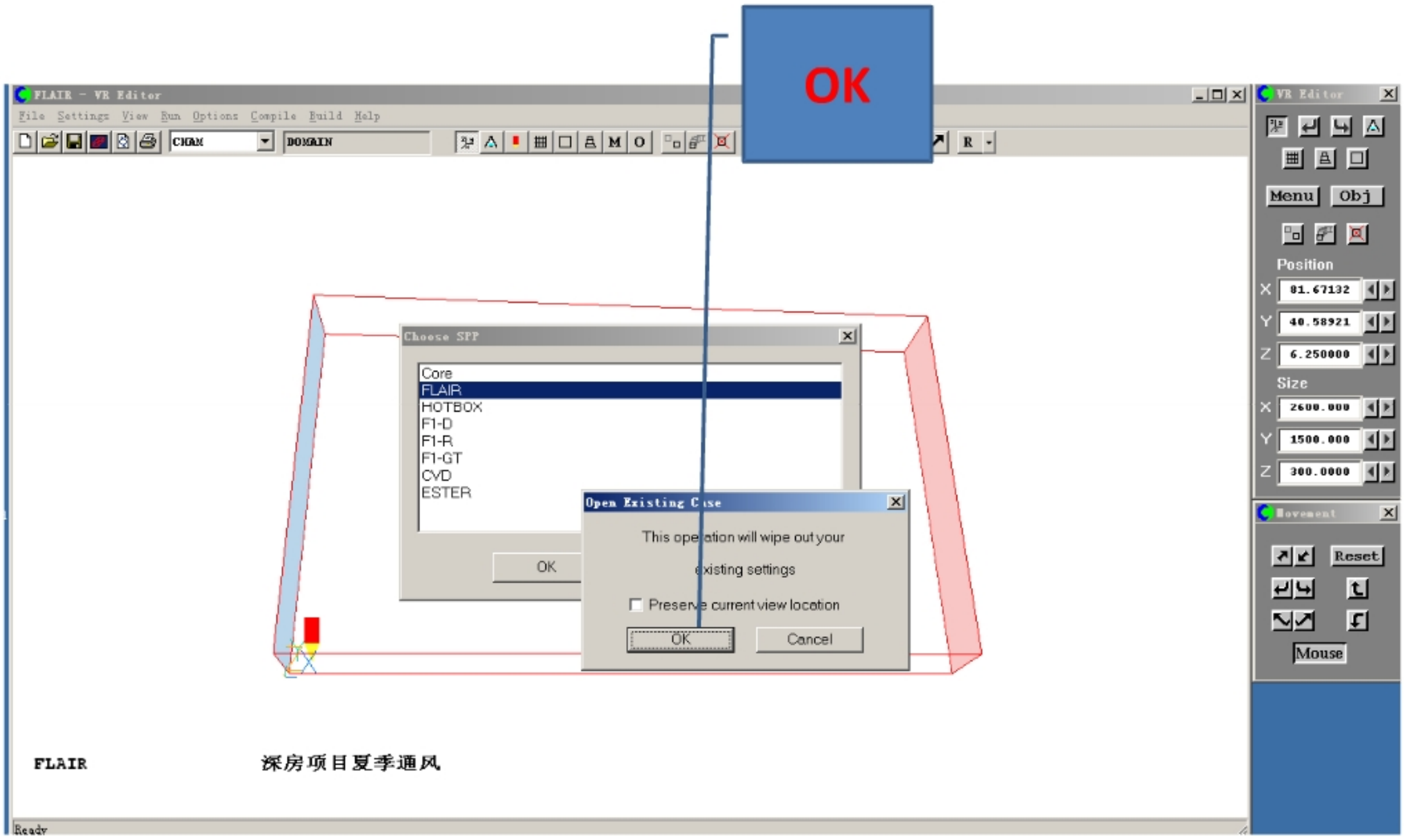
1. Stlout导出的模型为体；
2. 建筑方向布置使得来流风向水平或垂直；

文件存入的目录:

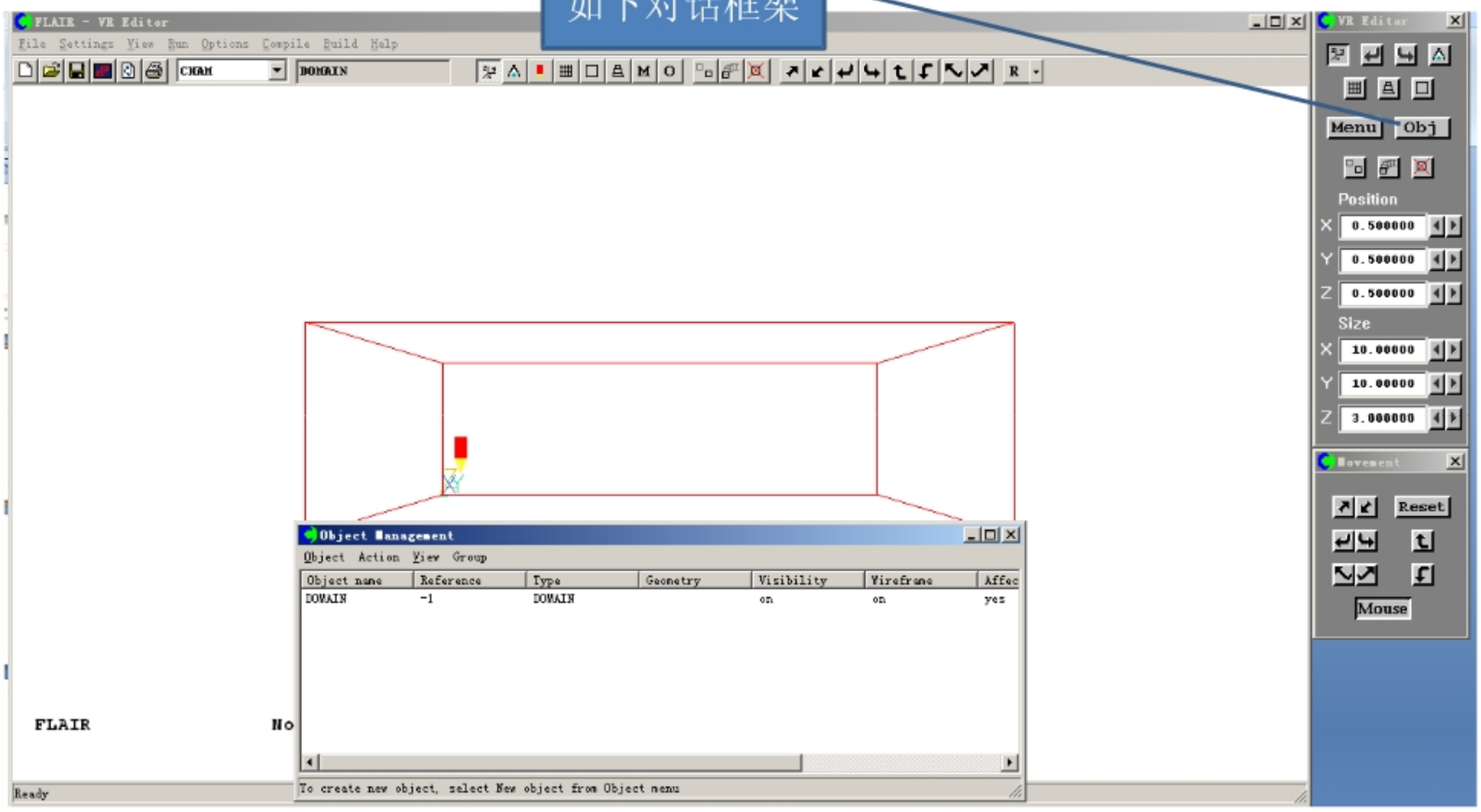


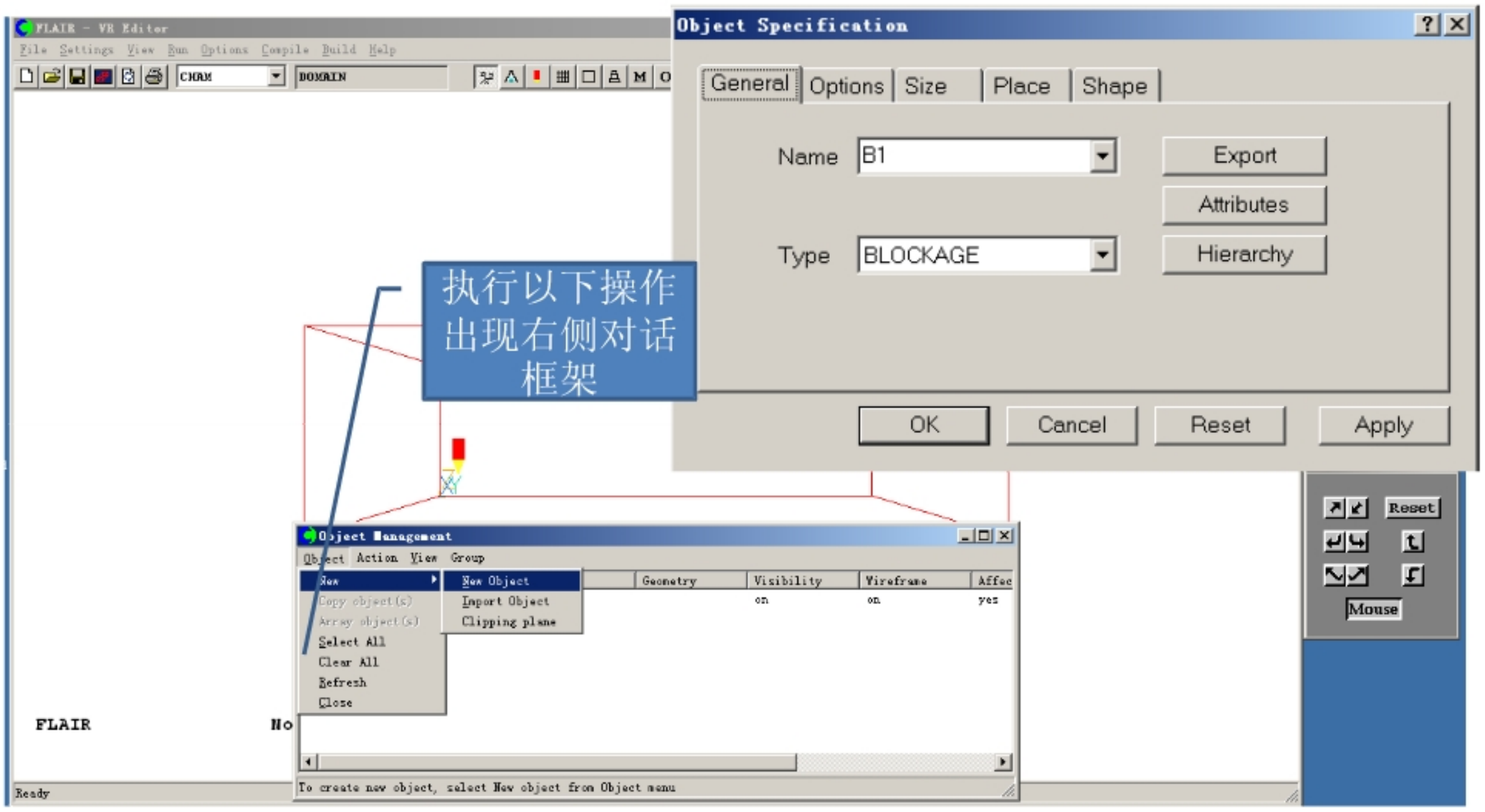
模型存入此目

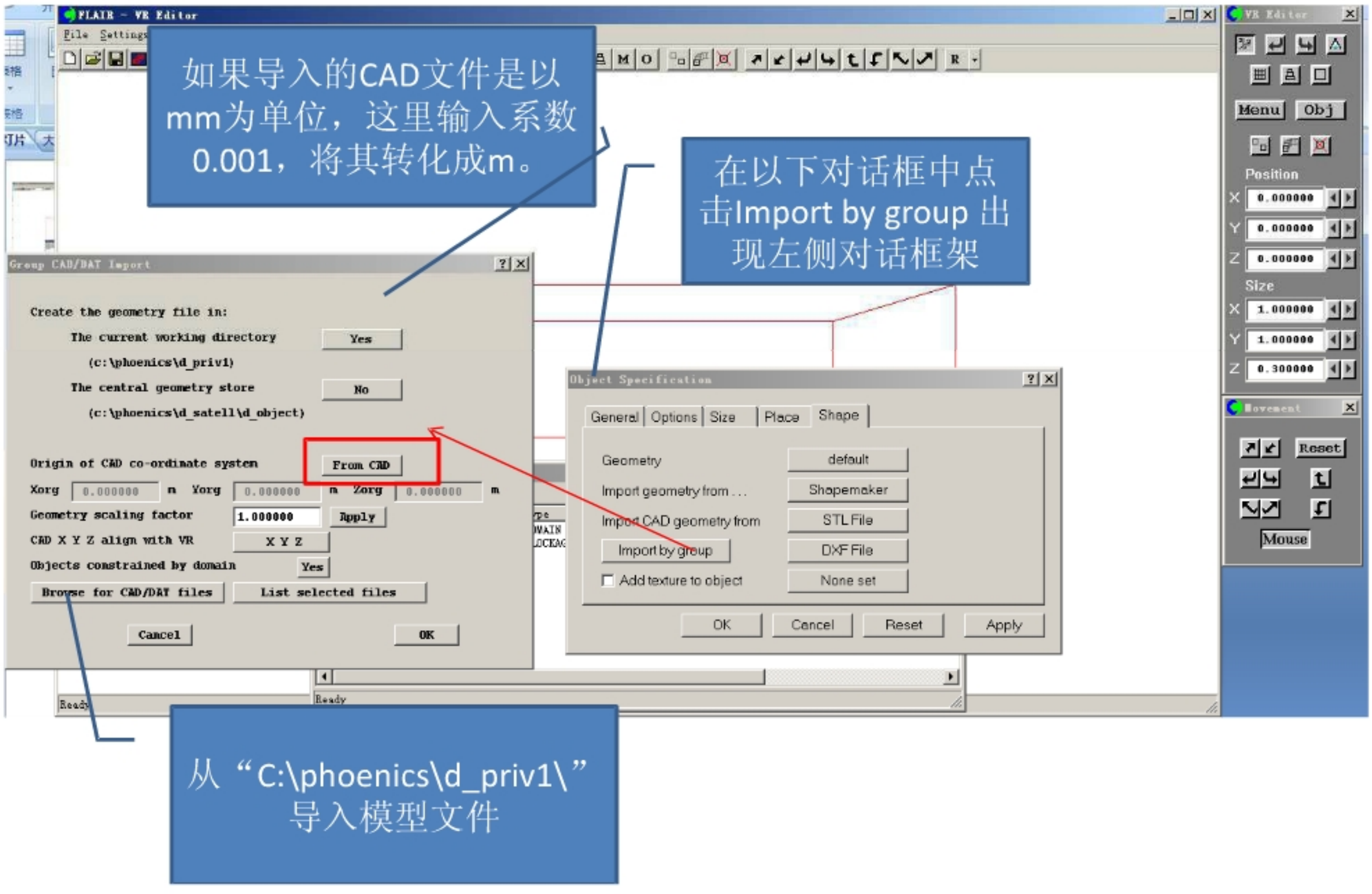

FLAIR - VR Editor
File Settings View Run Options Compile Build Help
Control panel
Movement control
Toolbars
Status bar
Text box
Show back of objects
Window size
可执行该操作调 出编辑框等各操作窗口
Start New case
Open Existing case ...
Load from Libraries ...
Reload Working files
Open file for Editing
View monitor plot
Save Working files
Save As a case ...
Save Window As ...
Print...
Exit (Save settings)
Quit (No Save)
Menu
Obj
Position
X 81.67132
Y 40.58921
Z 6.250000
Size
X 2600.000
Y 1500.000
风速入口
深圳夏季热岛:东南偏东风22.5° 2.1m/s;
冬季室外风环境：东北偏北22.5° 3m/s。
FLAIR
深房项目夏季通风
Ready

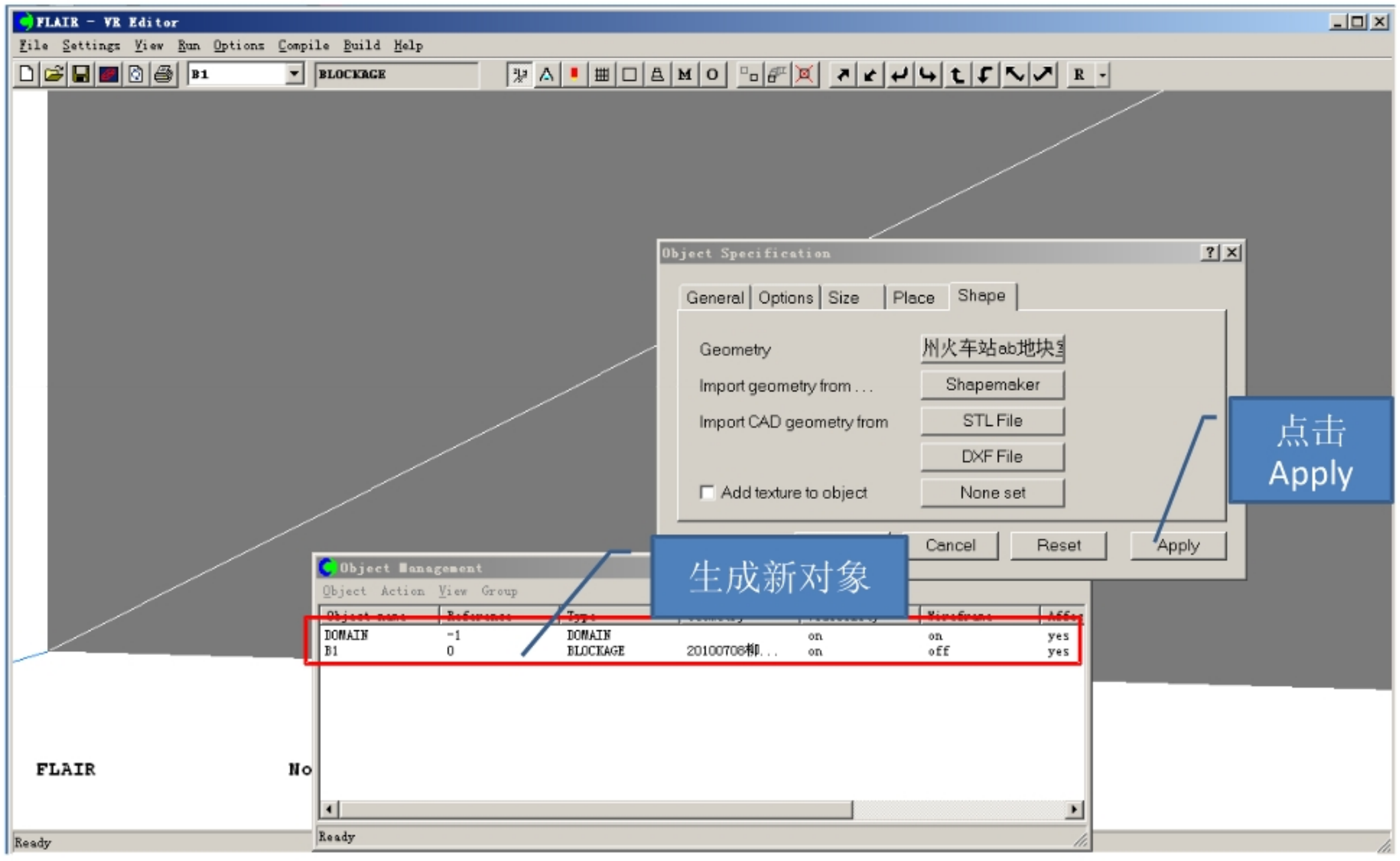

OK
FLAIR - VR Editor
File Settings View Run Options Compile Build Help
CHAM
DOMAIN
R
Choose SPP
Core
FLAIR
HOTBOX
F1-D
F1-R
F1-GT
CVD
ESTER
OK
Open Existing Case
This operation will wipe out your
existing settings
Preserve current view location
OK
Cancel
VR Editor
Menu
Obj
Position
X 81.67132
Y 40.58921
Z 6.250000
Size
X 2600.000
Y 1500.000
Z 300.0000
Movement
Reset
Mouse
FLAIR
深房项目夏季通风
Ready

点击OBJ出现
如下对话框架



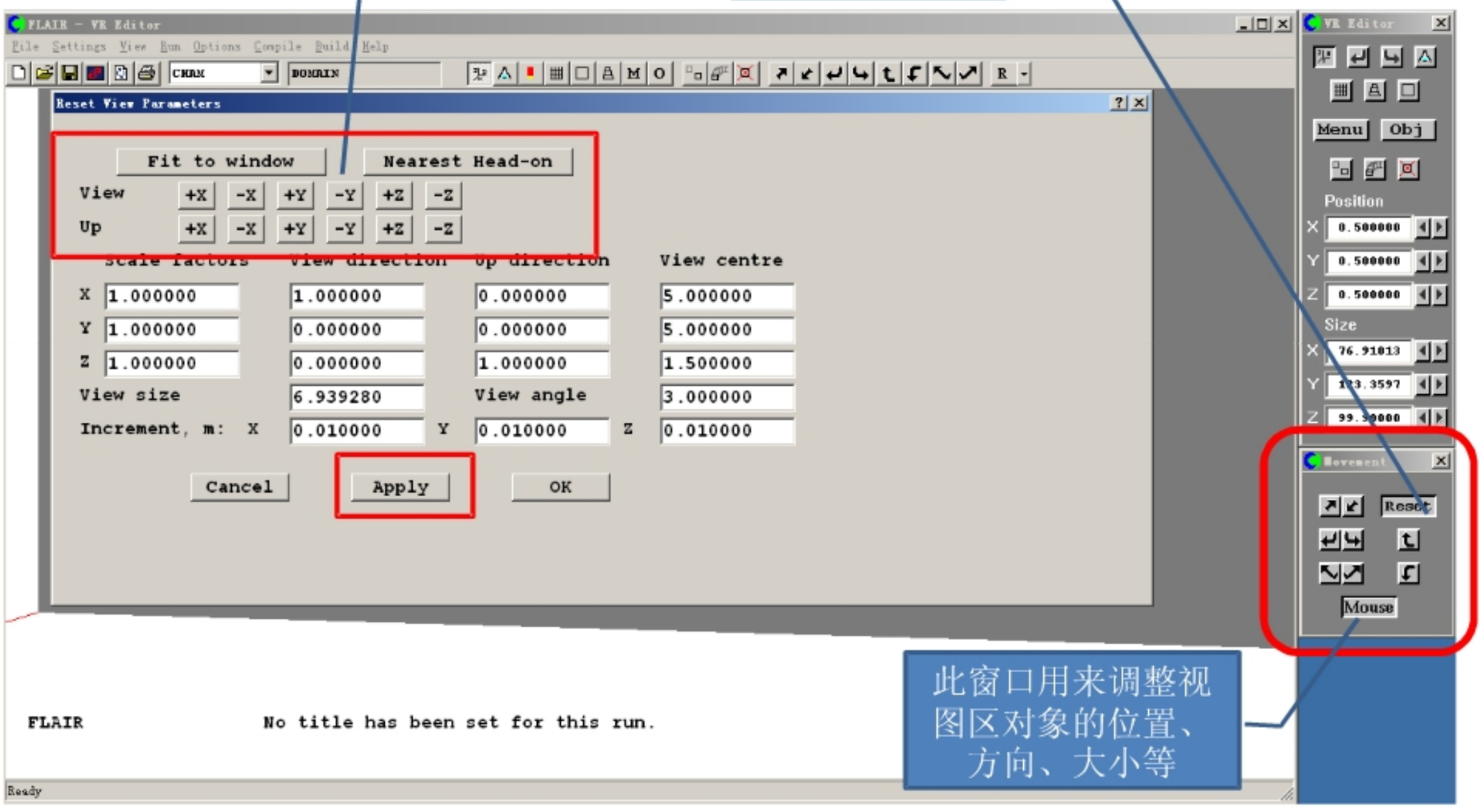

FLAIR - VR Editor
File Settings View Run Options Compile Build Help
CHAM
DOMAIN
执行以下操作
出现右侧对话
框架
Object Specification
General
Options
Size
Place
Shape
Name
B1
Export
Attributes
Type
BLOCKAGE
Hierarchy
OK
Cancel
Reset
Apply
Object Management
Object Action View Group
New
Copy object(s)
Array object(s)
Select All
Clear All
Refresh
Close
New Object
Import Object
Clipping plane
Geometry
Visibility
Wireframe
Affec
on
on
yes
FLAIR
No
Ready
To create new object, select New object from Object menu
Reset
Mouse


如果导入的CAD文件是以mm为单位，这里输入系数0.001，将其转化成m。
在以下对话框中点击Import by group 出现左侧对话框架
从“C:\phoenics\d_priv1\”导入模型文件
PLAIR - VR Editor
File Settings
Group CAD/DAT Import
Create the geometry file in:
The current working directory
Yes
(c:\phoenics\d_priv1)
The central geometry store
No
(c:\phoenics\d_satell\d_object)
Origin of CAD co-ordinate system
From CAD
Xorg 0.000000 m Yorg 0.000000 m Zorg 0.000000 m
Geometry scaling factor 1.000000 Apply
CAD X Y Z align with VR X Y Z
Objects constrained by domain Yes
Browse for CAD/DAT files
List selected files
Cancel
OK
Object Specification
General Options Size Place Shape
Geometry default
Import geometry from . . . Shapemaker
Import CAD geometry from STL File
Import by group DXF File
Add texture to object None set
OK Cancel Reset Apply
VR Editor
Menu Obj
Position
X 0.000000
Y 0.000000
Z 0.000000
Size
X 1.000000
Y 1.000000
Z 0.300000
Movement
Reset
Mouse
Ready
Ready


FLAIR - VR Editor
File Settings View Run Options Compile Build Help
B1
BLOCKAGE
Object Specification
General Options Size Place Shape
Geometry
州火车站ab地块
Import geometry from . . .
Shapemaker
Import CAD geometry from
STL File
DXF File
Add texture to object
None set
Cancel
Reset
Apply
点击
Apply
生成新对象
Object Management
Object Action View Group
DOMAIN -1 DOMAIN on on yes
B1 0 BLOCKAGE 20100706郁... on off yes
FLAIR
Ready
Ready

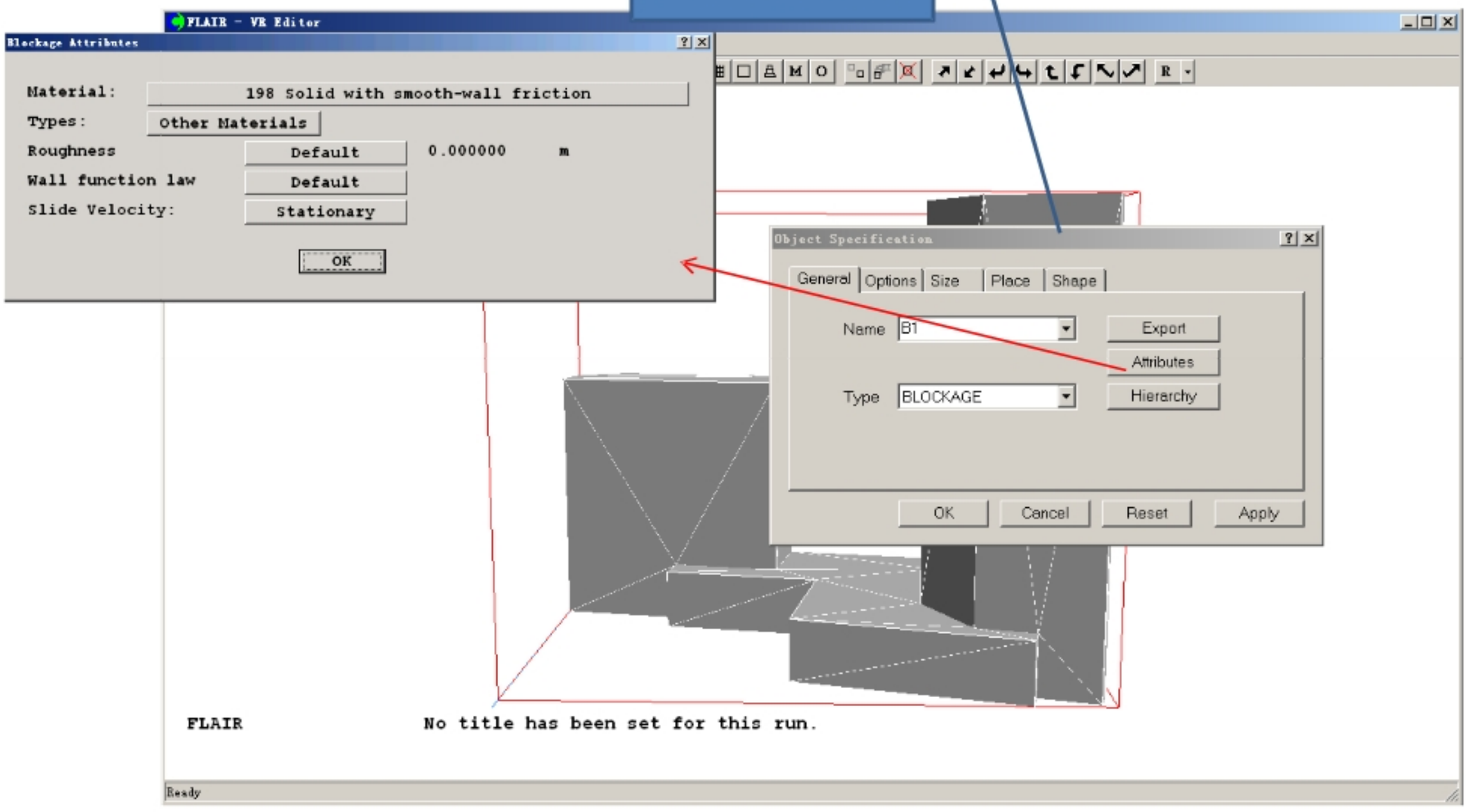
依次点击Fit to window \ Nearest Head-on\Up-+Z调整视角

点击Reset,出现右图对话框

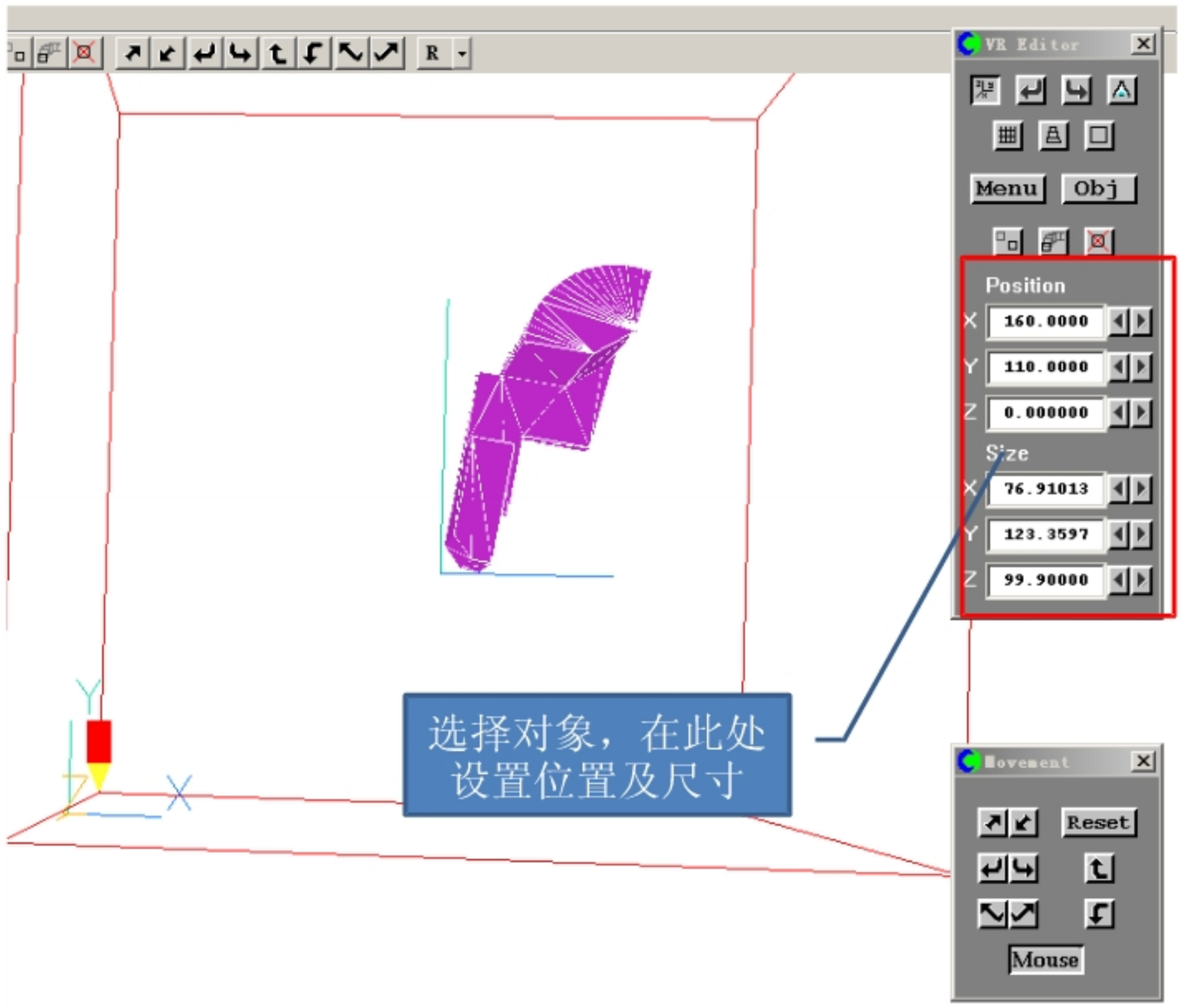


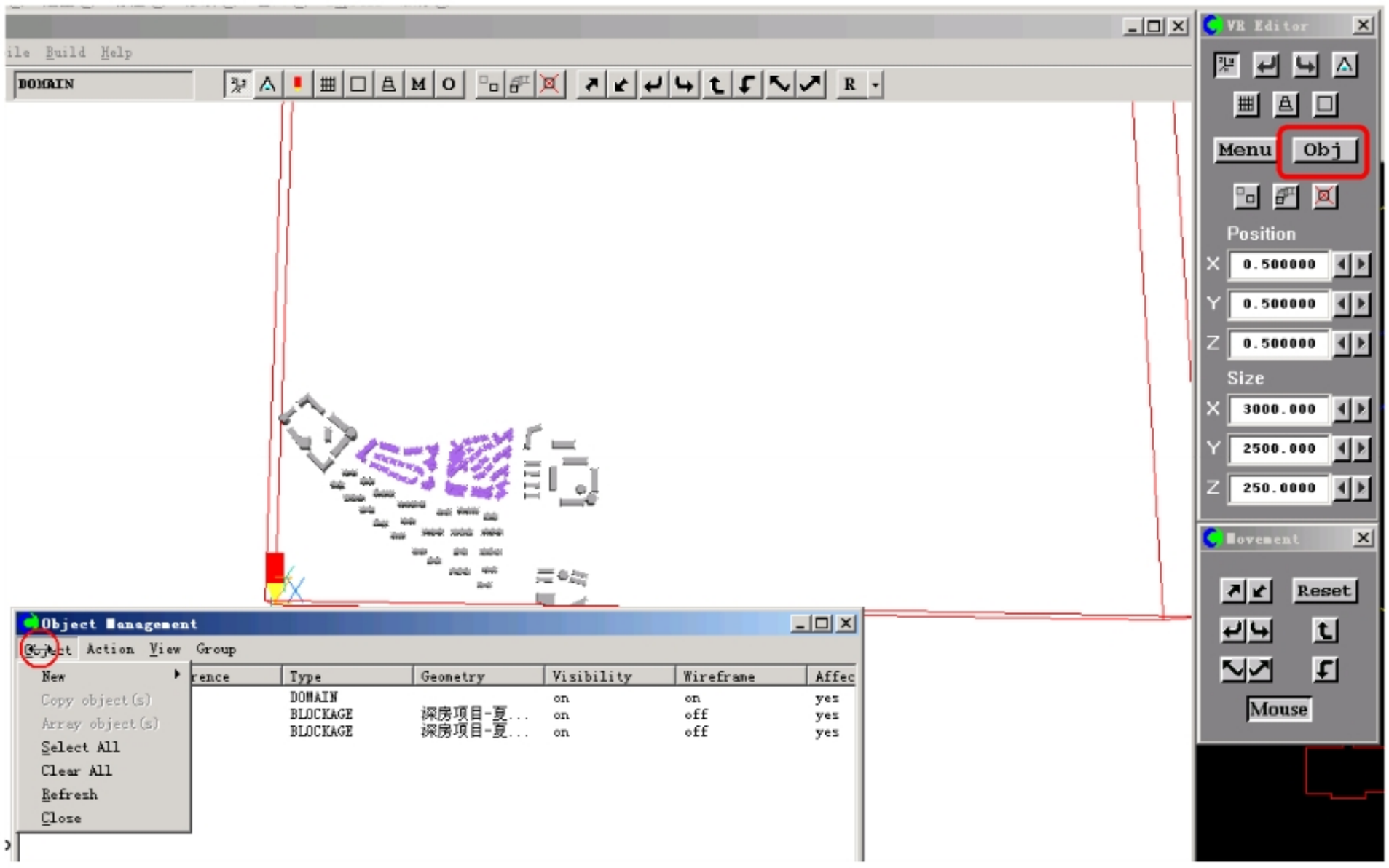
此窗口用来调整视图区对象的位置、方向、大小等

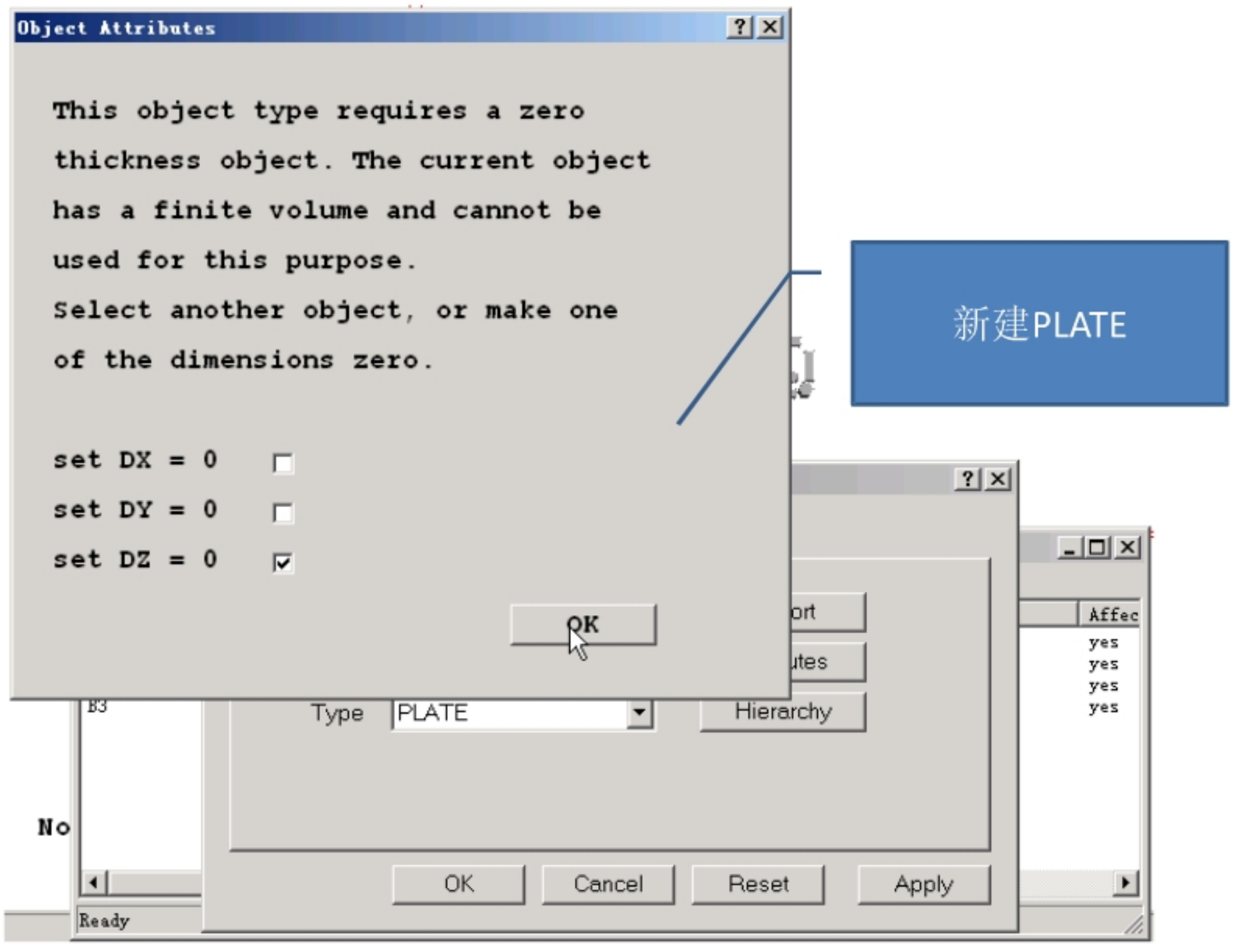
双击视图中的体，
出现如下对话框

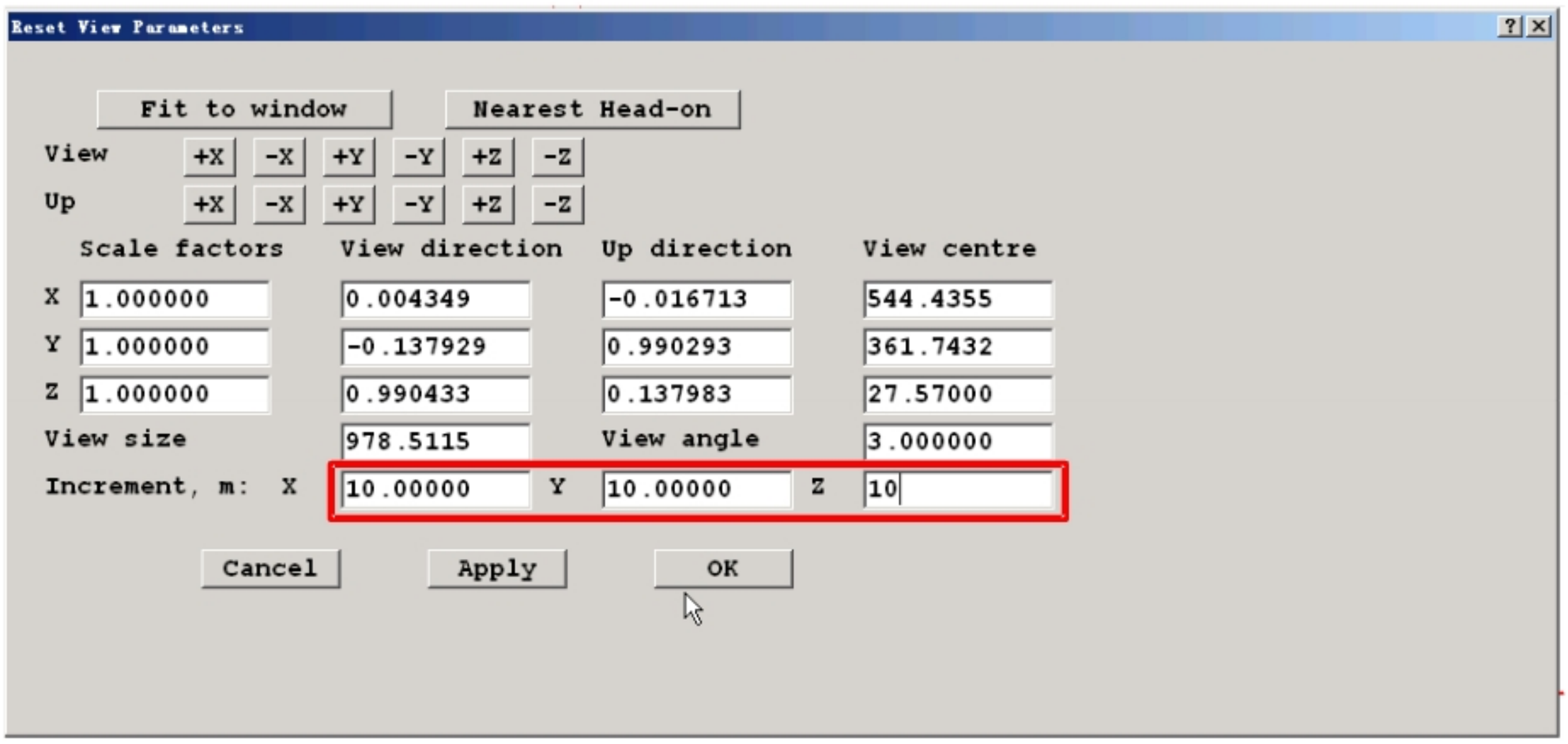


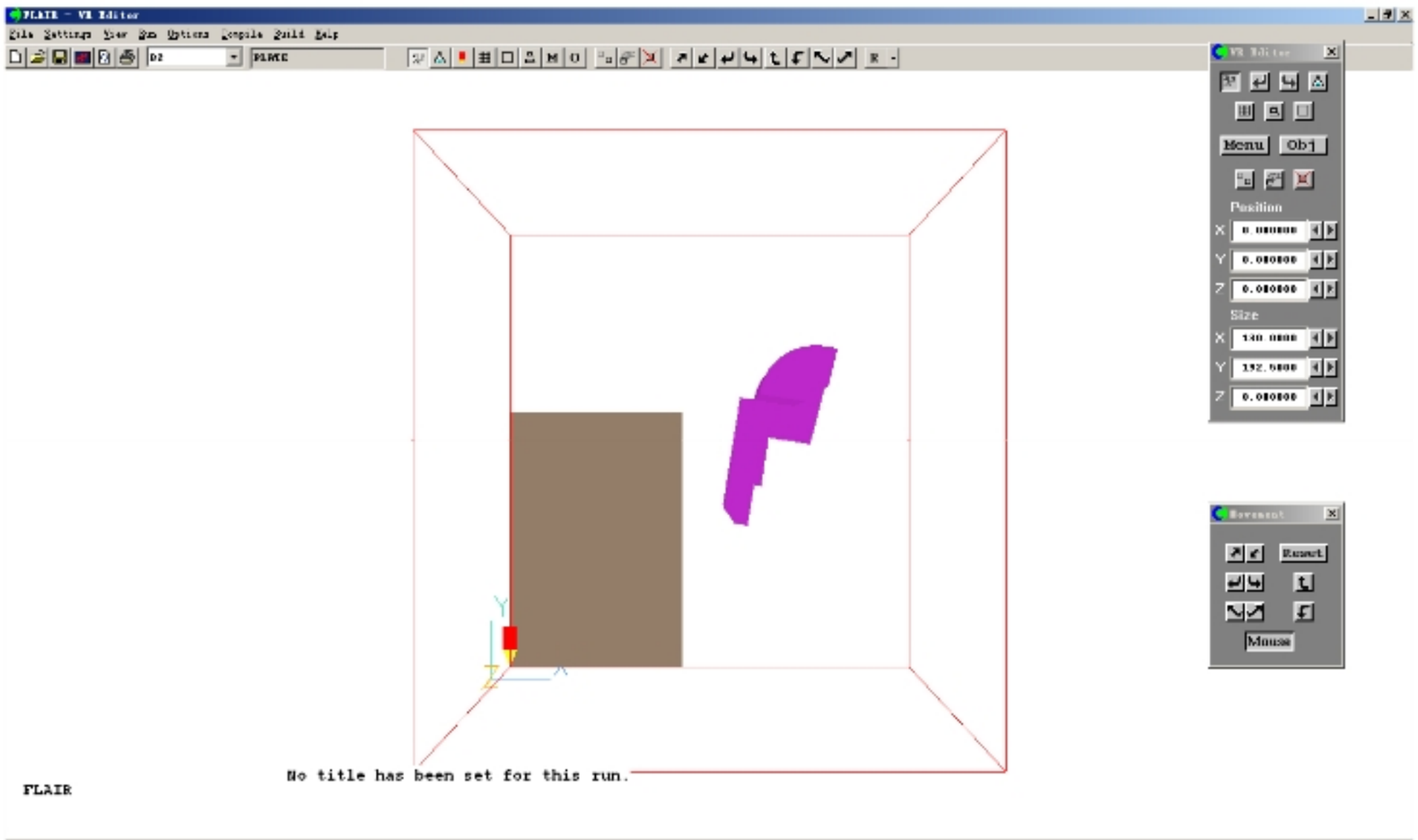

设置颜色
Object Specification
General
Options
Size
Place
Shape
Object Colour
40
As clipart
颜色
基本颜色(B):
自定义颜色(C):
规定自定义颜色(D) >>
确定
取消
色调(E): 160
红(R): 58
饱和度(S): 0
绿(G): 58
亮度(L): 55
蓝(U): 58
颜色|纯色(O)
添加到自定义颜色(A)

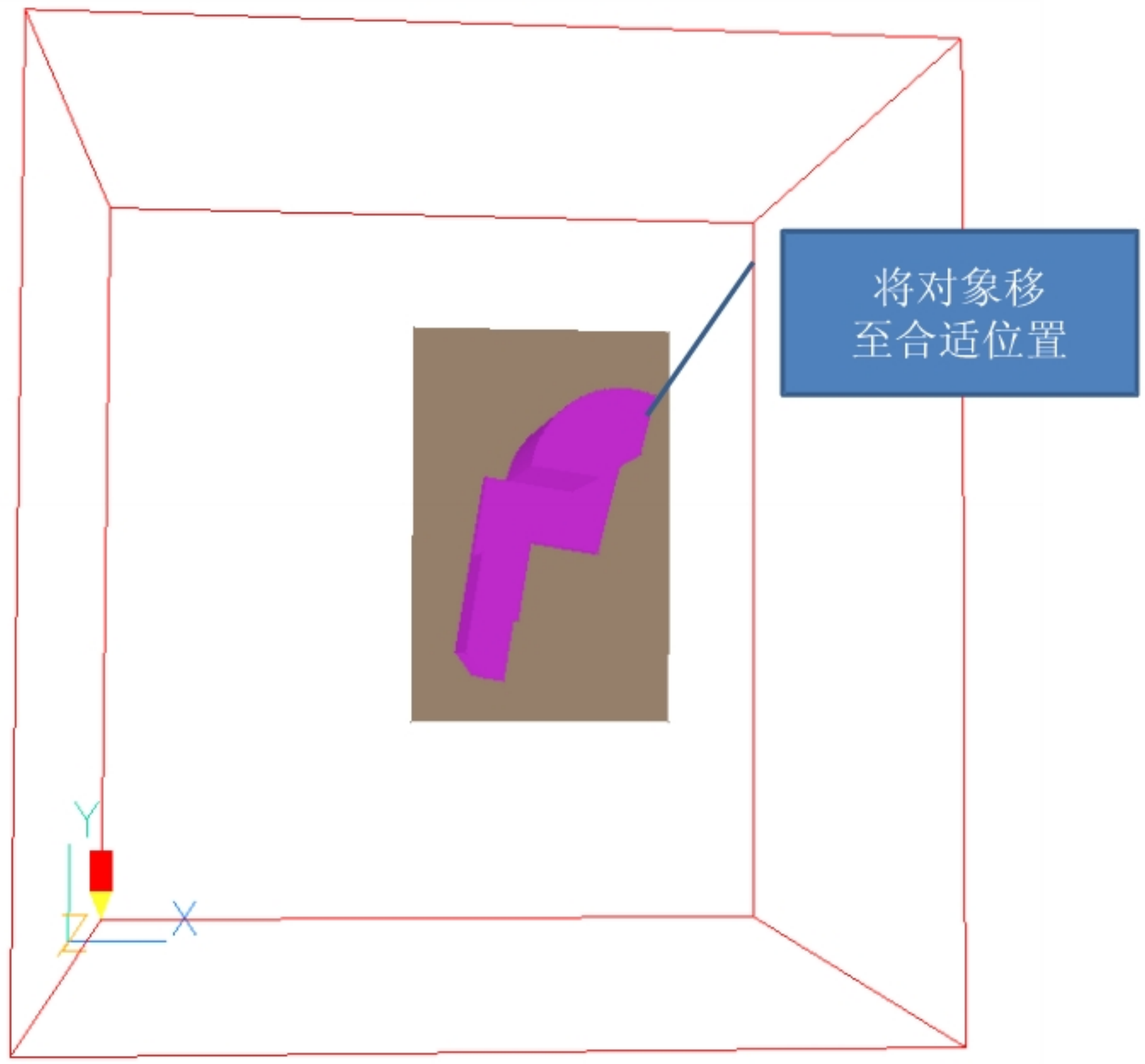

R
VR Editor
Menu
Obj
Position
X 160.0000
Y 110.0000
Z 0.000000
Size
X 76.91013
Y 123.3597
Z 99.90000
选择对象，在此处
设置位置及尺寸
Movement
Reset
Mouse

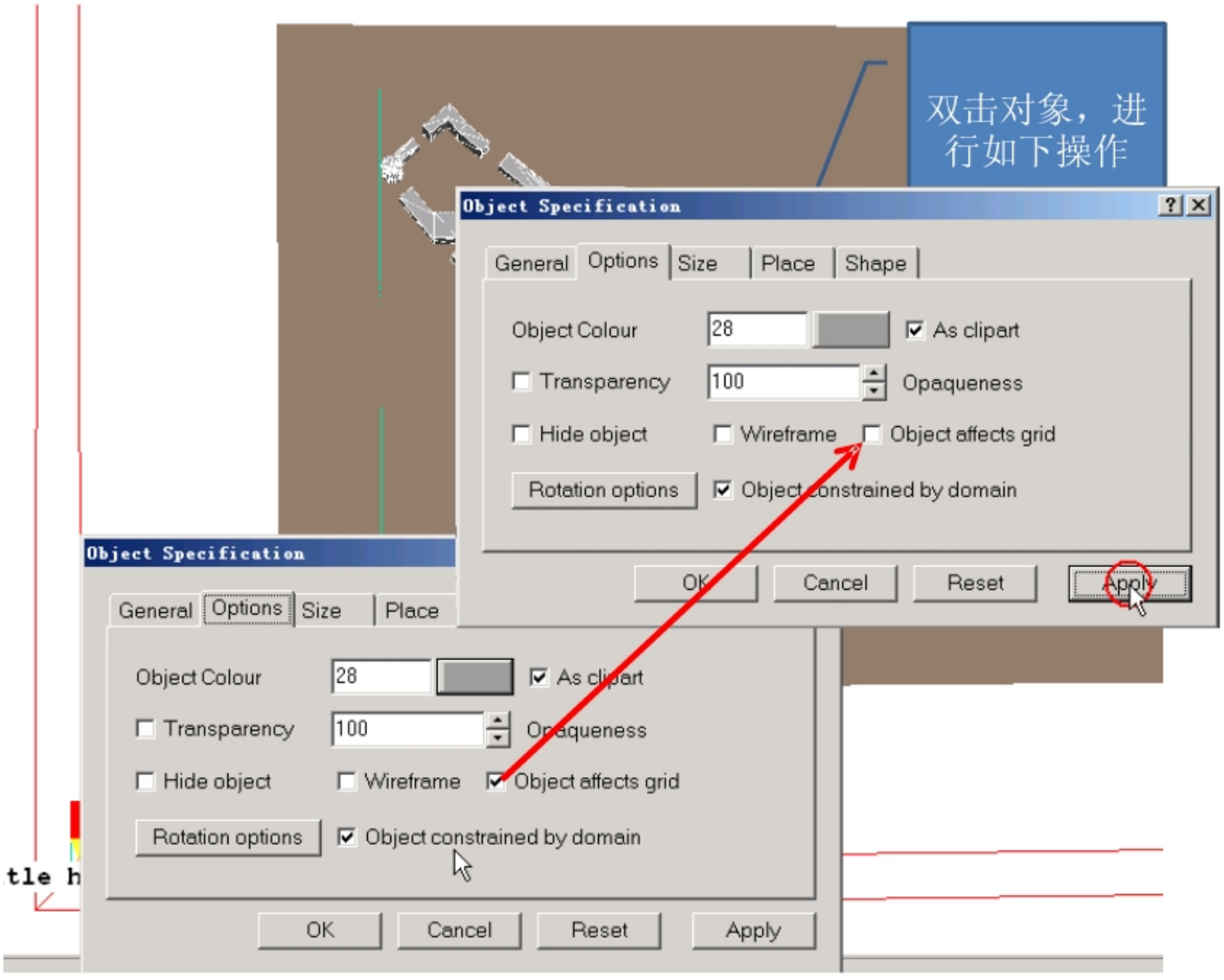

ile Build Help
DOMAIN
M O
R
VR Editor
Menu
Obj
Position
X 0.500000
Y 0.500000
Z 0.500000
Size
X 3000.000
Y 2500.000
Z 250.0000
Movement
Reset
Mouse
Object Management
Object Action View Group
New
Copy object(s)
Array object(s)
Select All
Clear All
Refresh
Close
rence Type Geometry Visibility Wireframe Affec
DOMAIN on on yes
BLOCKAGE 深房项目-夏... on off yes
BLOCKAGE 深房项目-夏... on off yes

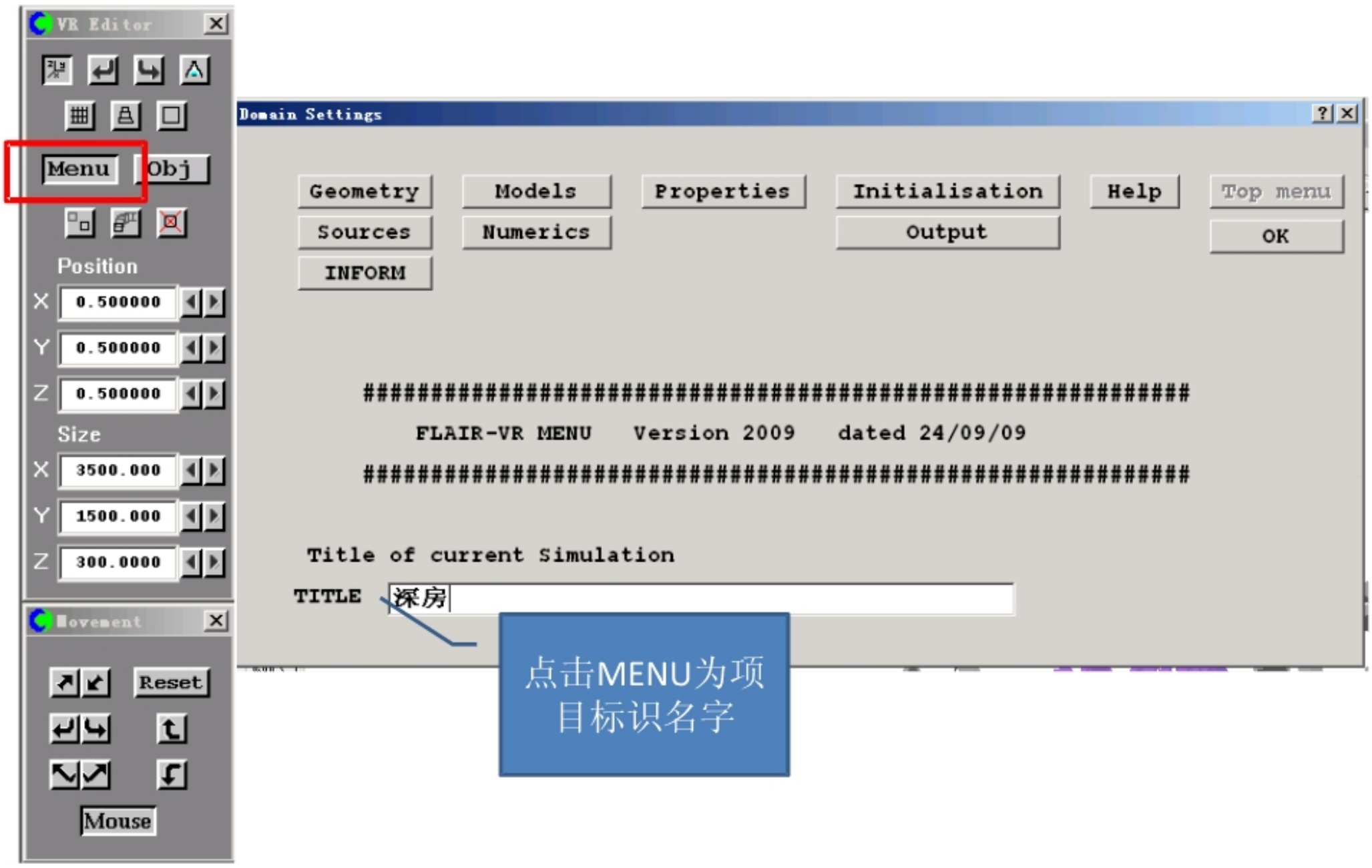

Object Attributes
This object type requires a zero thickness object. The current object has a finite volume and cannot be used for this purpose.
Select another object, or make one of the dimensions zero.
set DX = 0
set DY = 0
set DZ = 0
OK
新建PLATE
Type
PLATE
Hierarchy
OK
Cancel
Reset
Apply
Affec
yes
yes
yes
yes
Ready


Reset View Parameters
Fit to window
Nearest Head-on
View +X -X +Y -Y +Z -Z
Up +X -X +Y -Y +Z -Z
Scale factors
View direction
Up direction
View centre
X 1.000000 0.004349 -0.016713 544.4355
Y 1.000000 -0.137929 0.990293 361.7432
Z 1.000000 0.990433 0.137983 27.57000
View size 978.5115
View angle 3.000000
Increment, m: X 10.00000 Y 10.00000 Z 10
Cancel
Apply
OK

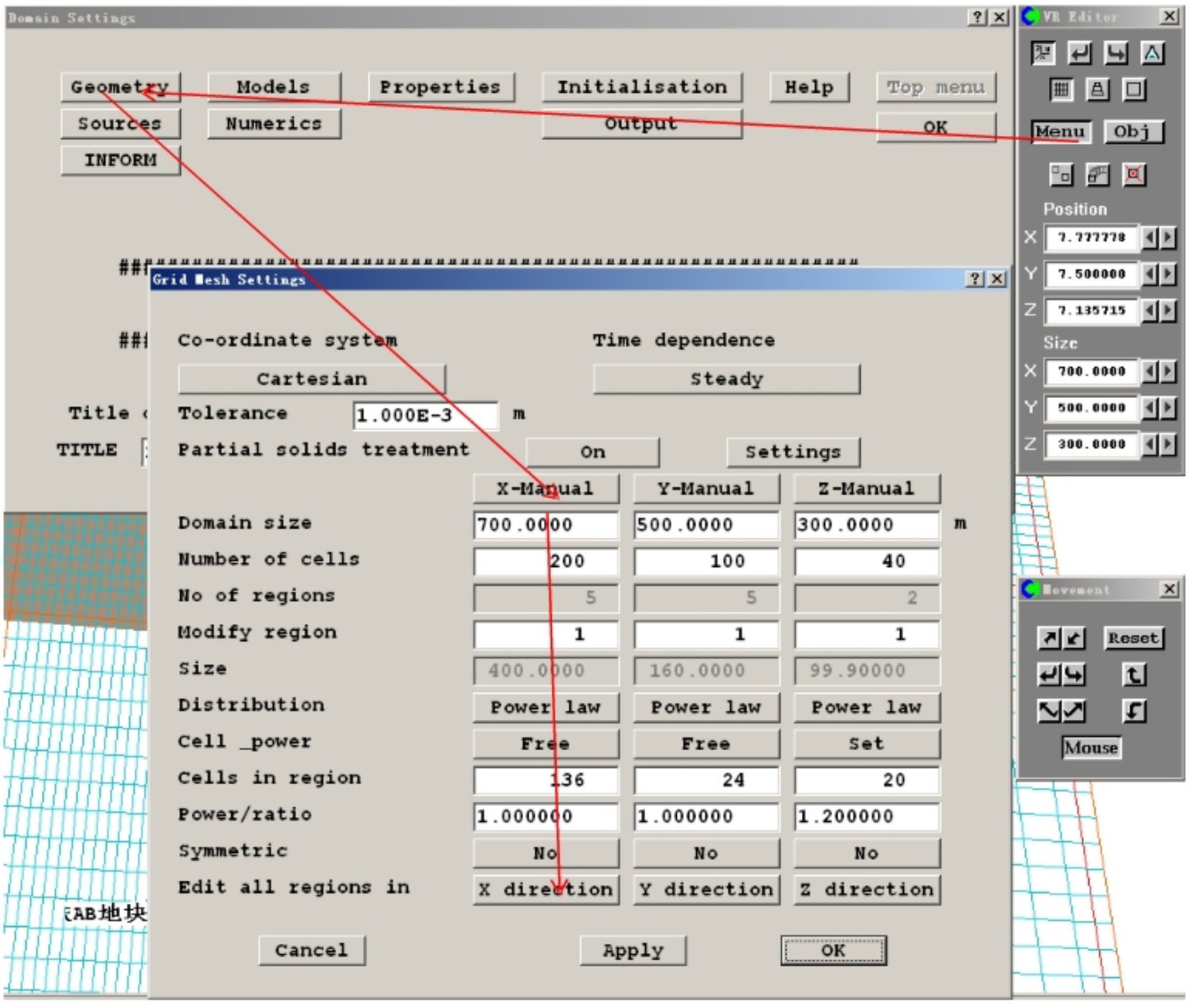

PLATE - VR Editor
File Settings View Geo Options Compile Build Help
D2
PLATE
R -
VR Editor
Menu
Obj
Position
X 0.000000
Y 0.000000
Z 0.000000
Size
X 140.0000
Y 192.5000
Z 0.000000
Reset
Mouse
No title has been set for this run.
FLAIR

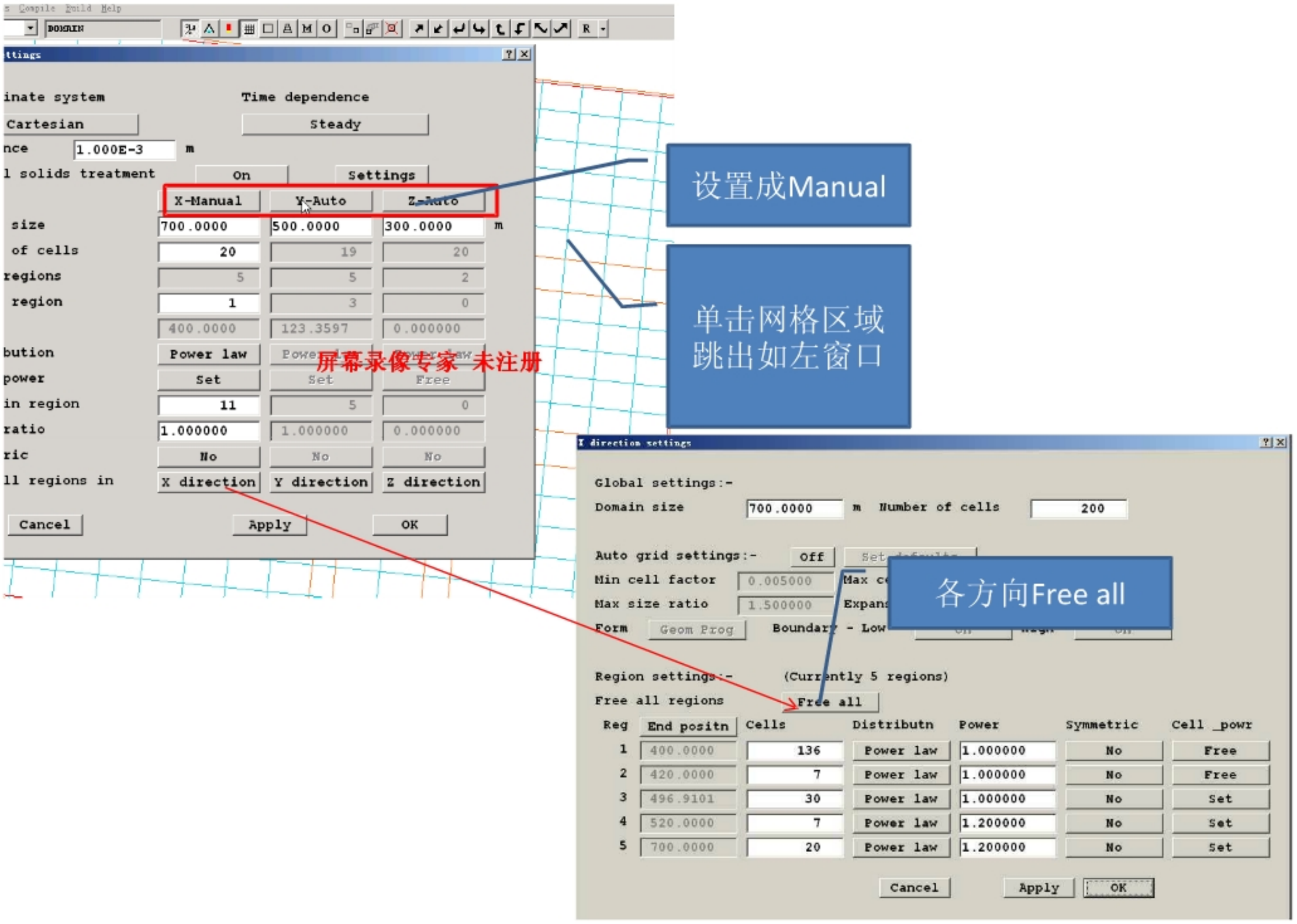

将对象移
至合适位置
Y
X
Z


双击对象，进行如下操作
Object Specification
General
Options
Size
Place
Shape
Object Colour
28
As clipart
Transparency
100
Opaqueness
Hide object
Wireframe
Object affects grid
Rotation options
Object constrained by domain
OK
Cancel
Reset
Apply
Object Specification
General
Options
Size
Place
Object Colour
28
As clipart
Transparency
100
Opaqueness
Hide object
Wireframe
Object affects grid
Rotation options
Object constrained by domain
OK
Cancel
Reset
Apply

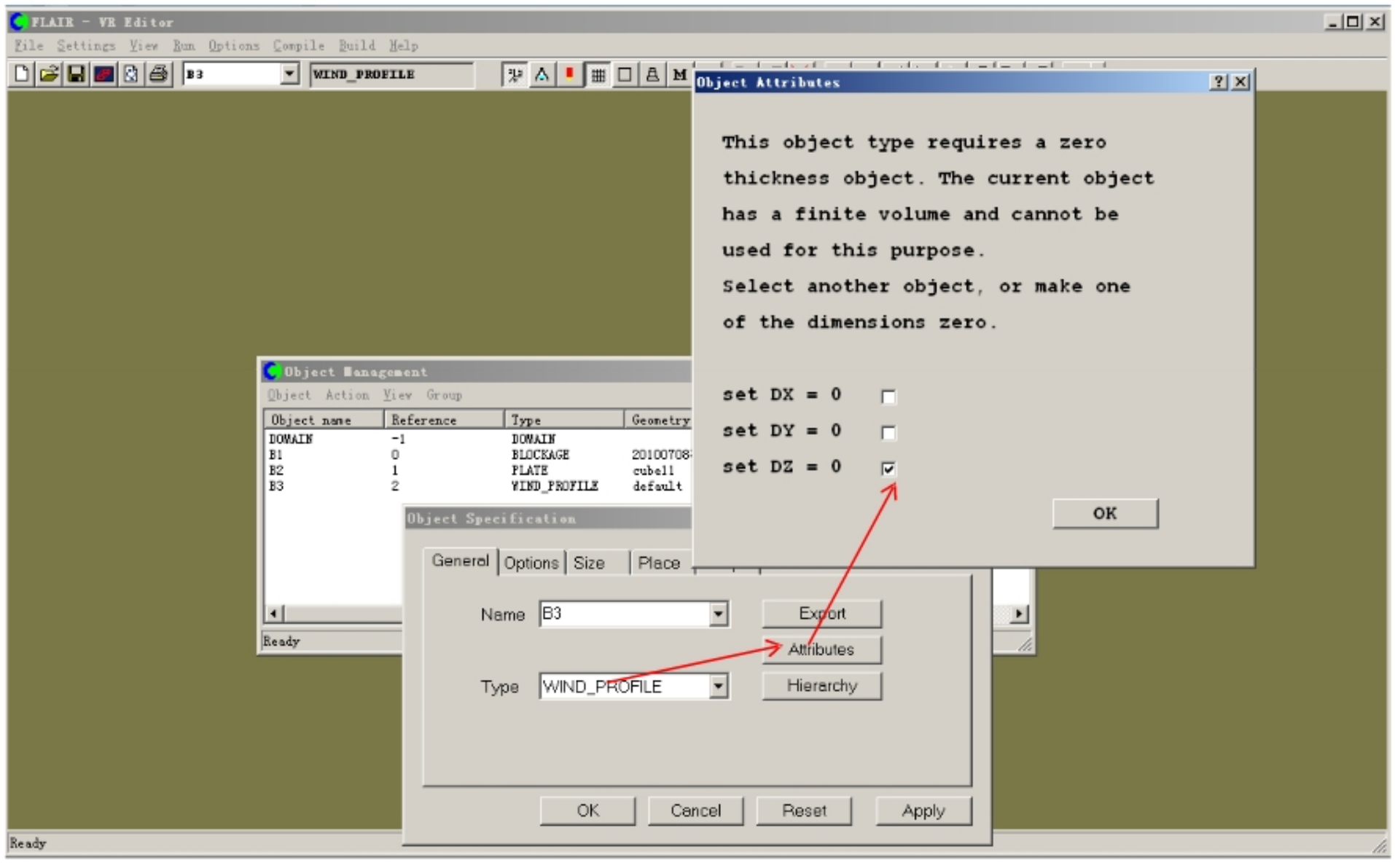

VR Editor
Menu
Obj
Position
X 0.500000
Y 0.500000
Z 0.500000
Size
X 3500.000
Y 1500.000
Z 300.0000
Movement
Reset
Mouse
Domain Settings
Geometry
Models
Properties
Initialisation
Help
Top menu
Sources
Numerics
Output
OK
INFORM
FLAIR-VR MENU Version 2009 dated 24/09/09
Title of current Simulation
TITLE 深房
点击MENU为项目标识名字

FLAIR - VR Editor
File Settings View Run Opt:
Start New case
Open Existing case ...
Load from Libraries ...
Reload Working files
Open file for Editing
View monitor plot
Save Working files
Save As a case ...
Save Window As ...
Print...
Exit (Save settings)
Quit (No Save)
Save Current Settings
Save changes to Q1 input file
Save changes to EARDAT file for Solver
OK
Cancel
另存为
保存在(I):
深房项目-夏季通风
桌面
我的电脑
网上邻居
我的文档
图片收藏
文件名(N):
深房项目夏季通风
保存类型(T):
Q1 files(*.q1)
保存(S)
取消

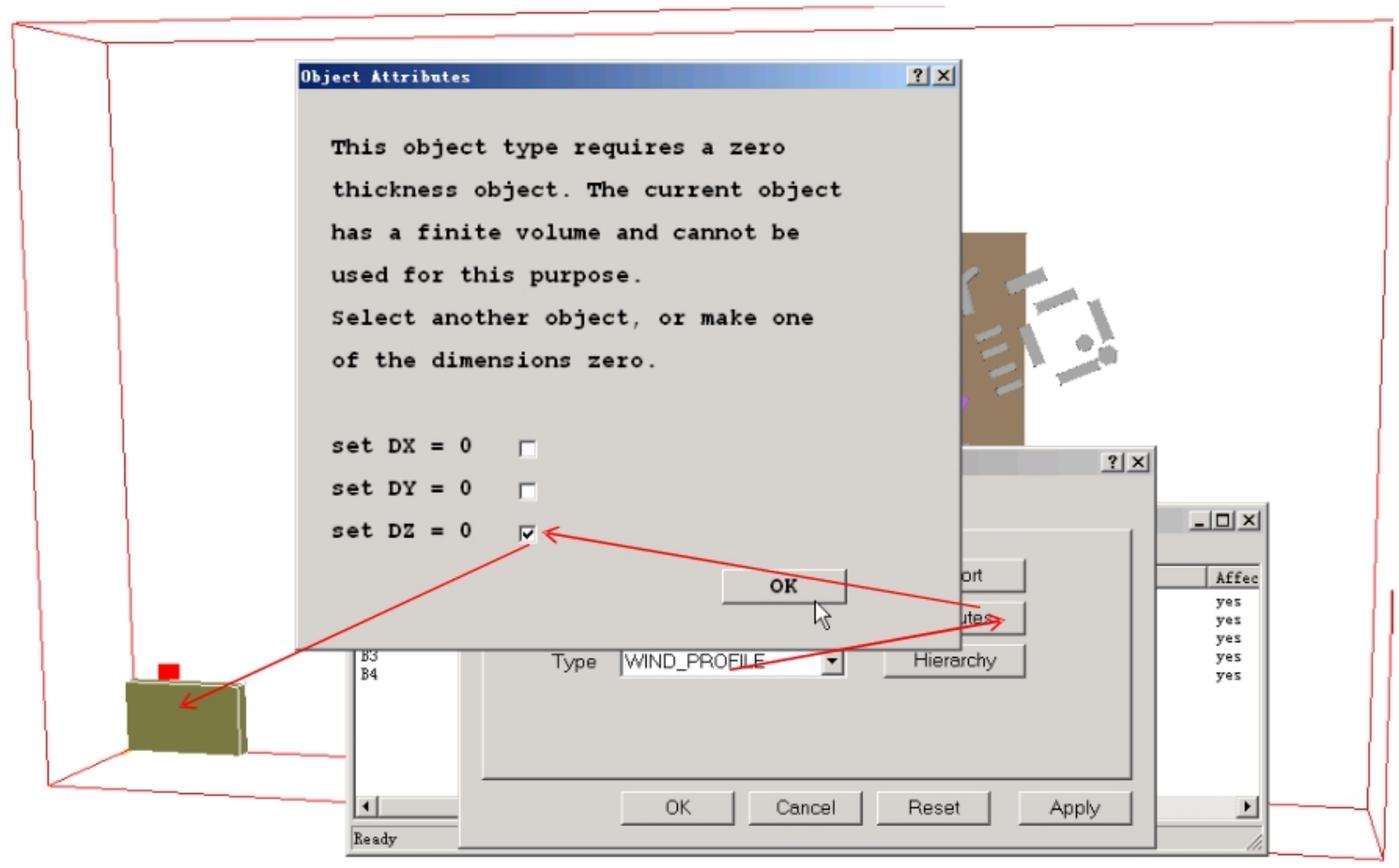

Domain Settings
Geometry
Models
Properties
Initialisation
Help
Top menu
Sources
Numerics
Output
OK
INFORM
Grid Mesh Settings
Co-ordinate system
Time dependence
Cartesian
Steady
Title
Tolerance
1.000E-3
m
TITLE
Partial solids treatment
On
Settings
X-Manual
Y-Manual
Z-Manual
Domain size
700.0000
500.0000
300.0000
m
Number of cells
200
100
40
No of regions
5
5
2
Modify region
1
1
1
Size
400.0000
160.0000
99.90000
Distribution
Power law
Power law
Power law
Cell _power
Free
Free
Set
Cells in region
136
24
20
Power/ratio
1.000000
1.000000
1.200000
Symmetric
No
No
No
Edit all regions in
X direction
Y direction
Z direction
Cancel
Apply
OK
AB地块
VR Editor
Menu
Obj
Position
X
7.777778
Y
7.500000
Z
7.135715
Size
X
700.0000
Y
500.0000
Z
300.0000
Movement
Reset
Mouse

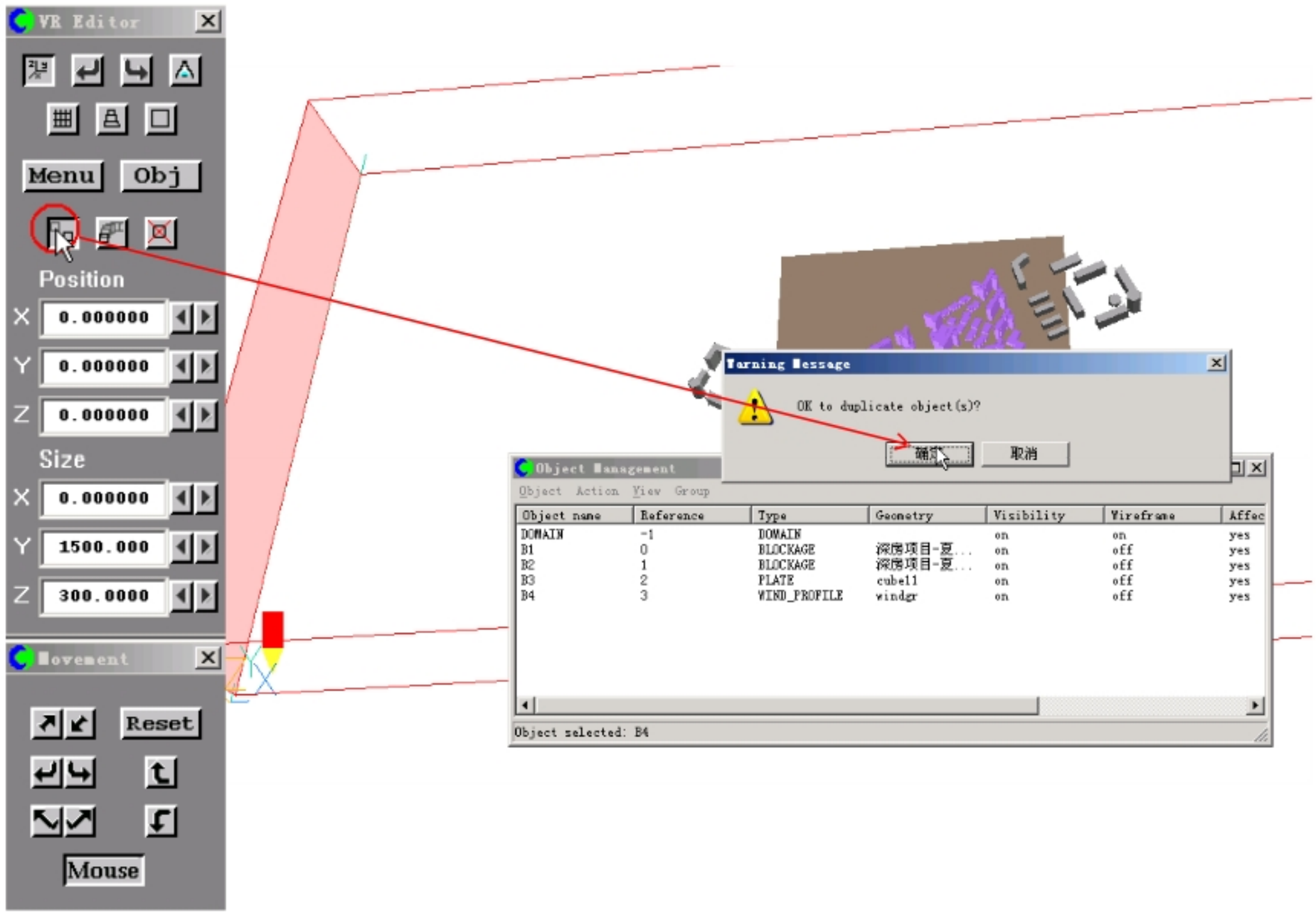

设置成Manual
单击网格区域
跳出如左窗口
各方向Free all
屏幕录像专家 未注册
ttings
inate system
Time dependence
Cartesian
Steady
nce
1.000E-3
m
l solids treatment
On
Settings
X-Manual
Y-Auto
Z-Auto
size
700.0000
500.0000
300.0000
m
of cells
20
19
20
regions
5
5
2
region
1
3
0
400.0000
123.3597
0.000000
bution
Power law
power
Set
Free
in region
11
5
0
ratio
1.000000
1.000000
0.000000
ric
No
No
No
ll regions in
X direction
Y direction
Z direction
Cancel
Apply
OK
X direction settings
Global settings:-
Domain size
700.0000
m
Number of cells
200
Auto grid settings:-
Off
Min cell factor
0.005000
Max size ratio
1.500000
Form
Geom Prog
Region settings:-
(Currently 5 regions)
Free all regions
Free all
Reg
End positn
Cells
Distributn
Power
Symmetric
Cell _powr
1
400.0000
136
Power law
1.000000
No
Free
2
420.0000
7
Power law
1.000000
No
Free
3
496.9101
30
Power law
1.000000
No
Set
4
520.0000
7
Power law
1.200000
No
Set
5
700.0000
20
Power law
1.200000
No
Set
Cancel
Apply
OK

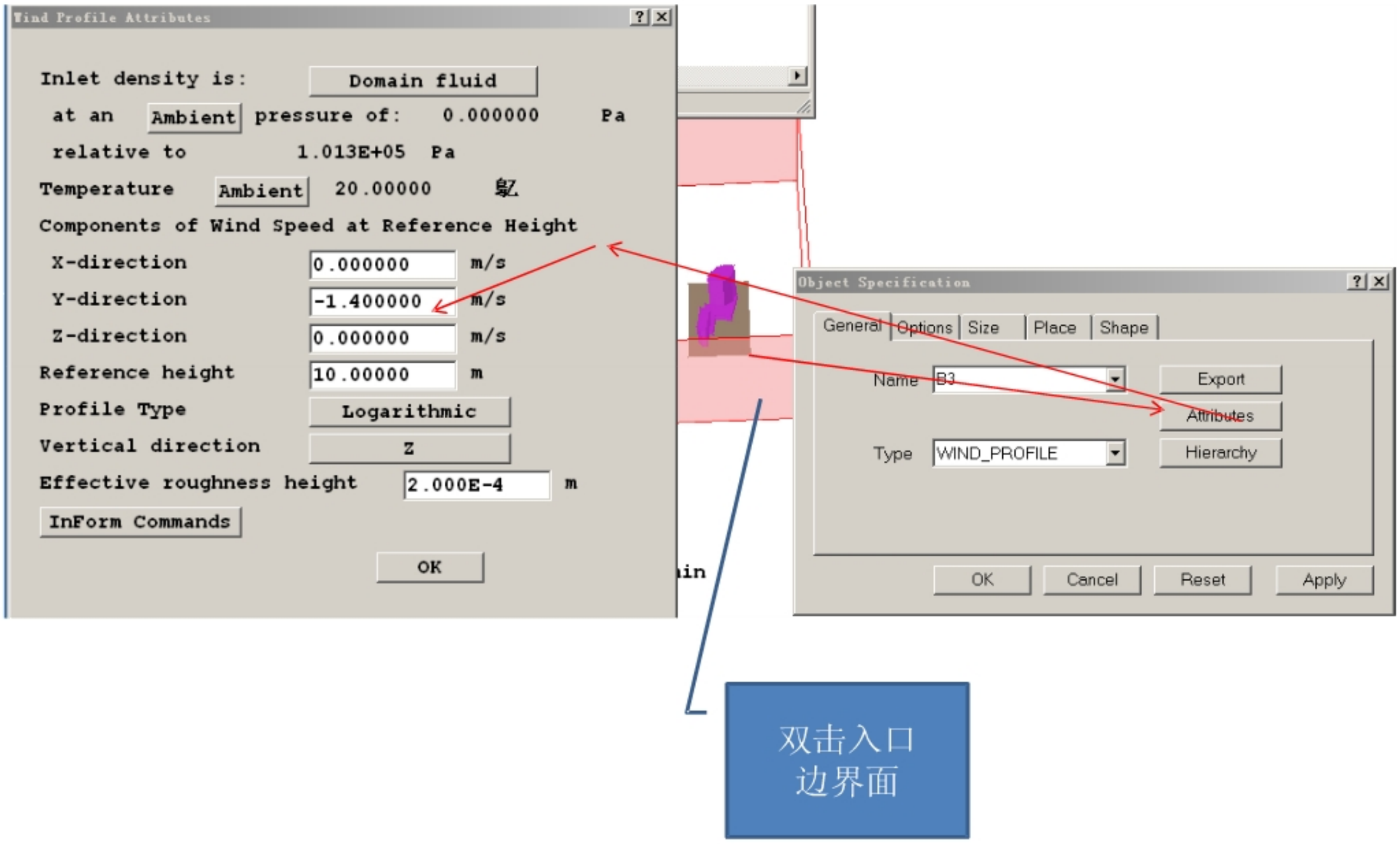
建立进出口边界面


FLAIR - VR Editor
File Settings View Run Options Compile Build Help
B3
WIND_PROFILE
Object Attributes
This object type requires a zero thickness object. The current object has a finite volume and cannot be used for this purpose.
Select another object, or make one of the dimensions zero.
set DX = 0
set DY = 0
set DZ = 0
OK
Object Management
Object Action View Group
Object name
Reference
Type
Geometry
DOMAIN
-1
DOMAIN
B1
0
BLOCKAGE
B2
1
PLATE
cube11
B3
2
WIND_PROFILE
default
Ready
Object Specification
General
Options
Size
Place
Name
B3
Export
Attributes
Type
WIND_PROFILE
Hierarchy
OK
Cancel
Reset
Apply
Ready

建立出口边界面


Object Attributes
This object type requires a zero thickness object. The current object has a finite volume and cannot be used for this purpose.
Select another object, or make one of the dimensions zero.
set DX = 0
set DY = 0
set DZ = 0
OK
Type
WIND_PROFILE
Hierarchy
OK
Cancel
Reset
Apply
Ready
Affec
yes
yes
yes
yes
yes
B3
B4


VR Editor
Menu
Obj
Position
X
0.000000
Y
0.000000
Z
0.000000
Size
X
0.000000
Y
1500.000
Z
300.0000
Movement
Reset
Mouse
Warning Message
OK to duplicate object(s)?
确定
取消
Object Management
Object Action View Group
Object name | Reference | Type | Geometry | Visibility | Wireframe | Affec
DOMAIN | -1 | DOMAIN | | on | on | yes
B1 | 0 | BLOCKAGE | 深房项目-夏... | on | off | yes
B2 | 1 | BLOCKAGE | 深房项目-夏... | on | off | yes
B3 | 2 | PLATE | cube11 | on | off | yes
B4 | 3 | WIND_PROFILE | windgr | on | off | yes
Object selected: B4


Wind Profile Attributes
Inlet density is:
Domain fluid
at an
Ambient
pressure of:
0.000000
Pa
relative to
1.013E+05
Pa
Temperature
Ambient
20.00000
Components of Wind Speed at Reference Height
X-direction
0.000000
m/s
Y-direction
-1.400000
m/s
Z-direction
0.000000
m/s
Reference height
10.00000
m
Profile Type
Logarithmic
Vertical direction
Z
Effective roughness height
2.000E-4
m
InForm Commands
OK
Object Specification
General
Options
Size
Place
Shape
Name
B3
Export
Attributes
Type
WIND_PROFILE
Hierarchy
OK
Cancel
Reset
Apply
双击入口
边界面

Wind Profile Attributes

Inlet density is: Domain fluid

at an Ambient pressure of: 0.000000 Pa

relative to 1.013E+05 Pa

Temperature Ambient 20.00000 ℃

Components of Wind Speed at Reference Height

X-direction 0.000000 m/s

Y-direction -1.400000 m/s

Z-direction 0.000000 m/s

Reference height 10.00000 m

Profile Type Power Law

Power Law index 0.142857

Vertical direction Z

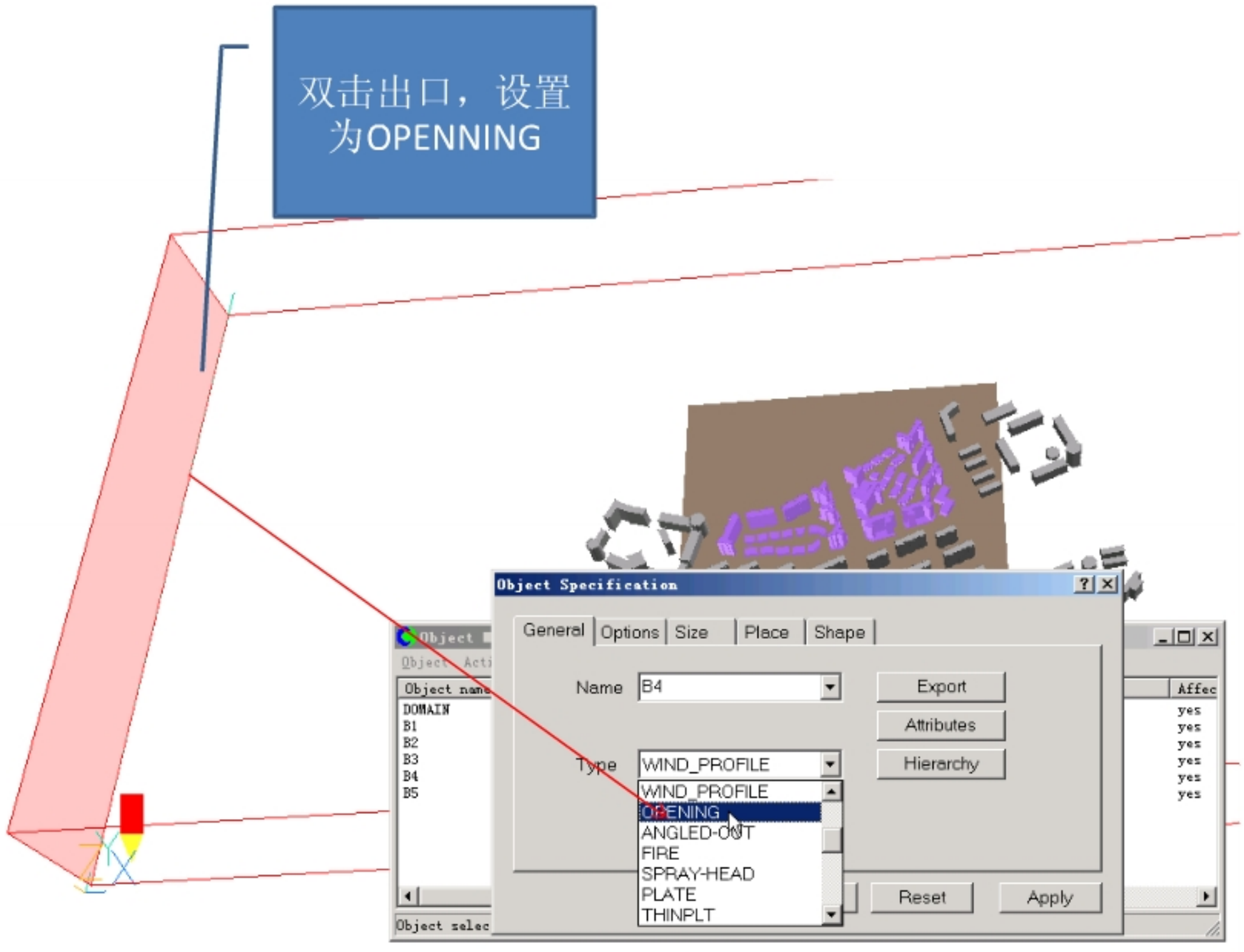
Effective roughness height 2.000E-4 m

InForm Commands

OK

设置成Power Law

双击出口，设置为OPENNING

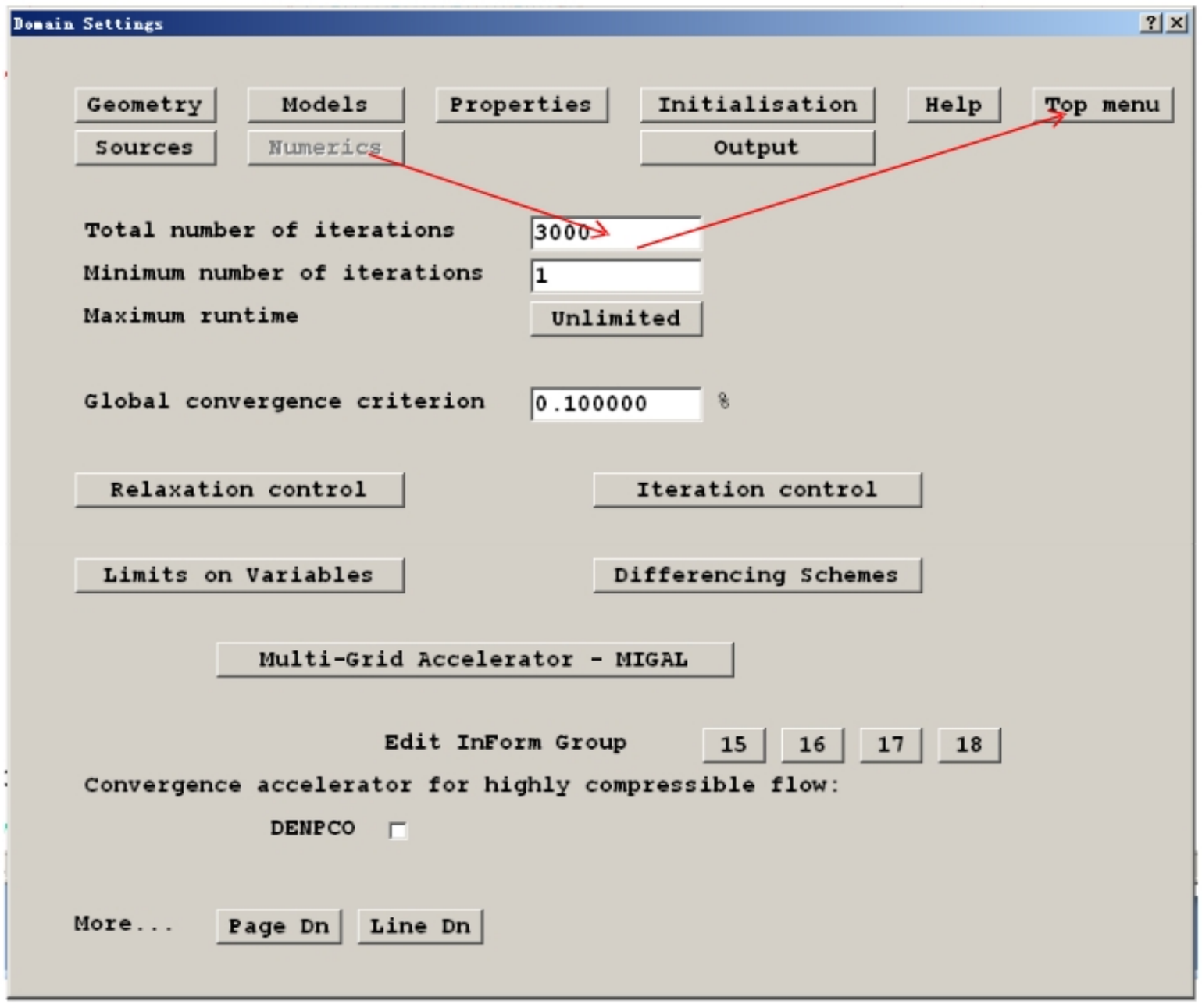


Domain Settings

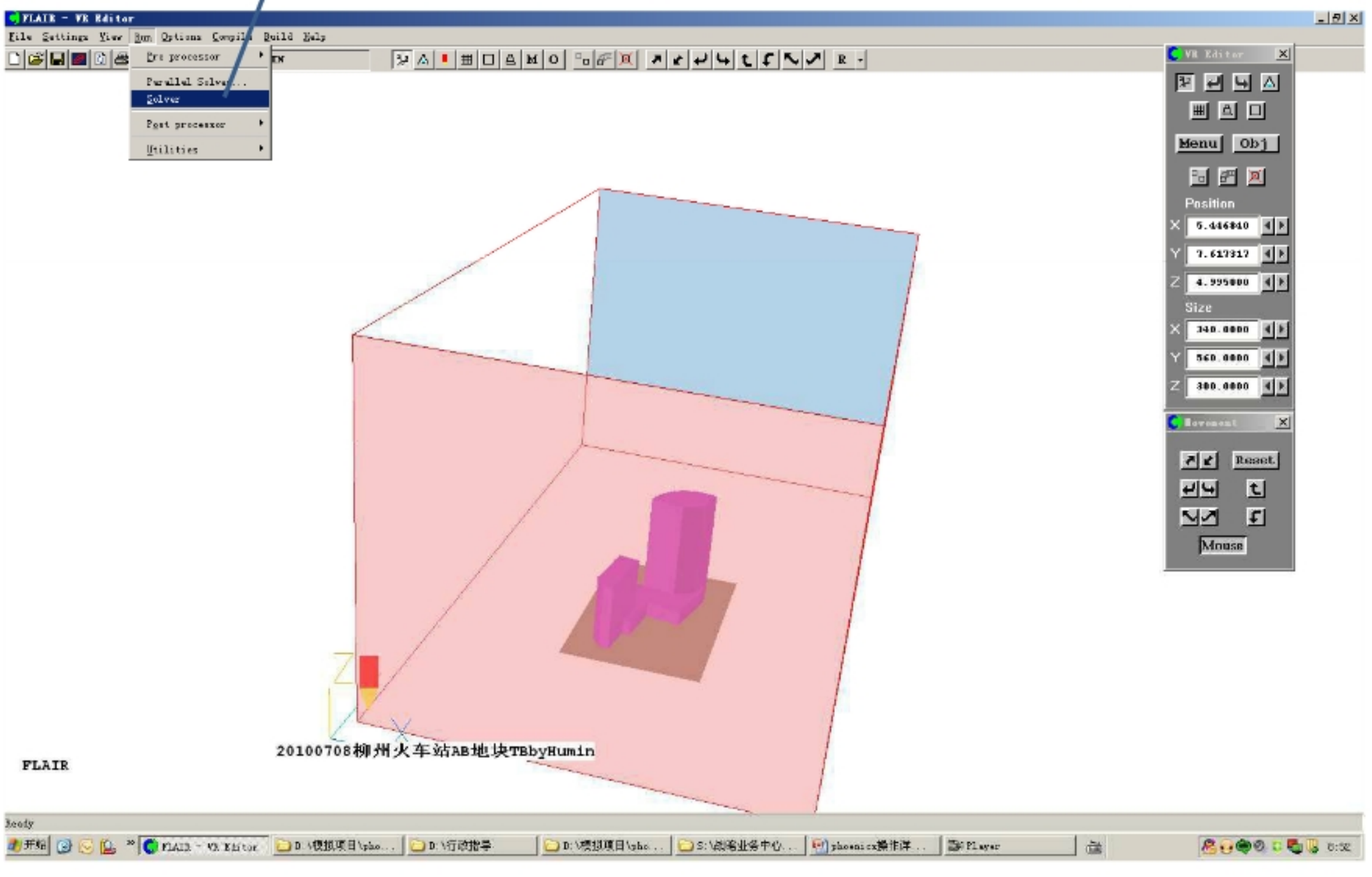
Geometry | Models | Properties | Initialisation | Help | Top menu

Sources | Numerics | Output

Equation formulation	Elliptic-Staggered
Lagrangian Particle Tracker (GENTRA)	OFF
Solution for velocities and pressure	ON
Energy Equation	OFF
Turbulence models	KEMODL settings
Radiation models	OFF
Fan operating point	OFF
System Curve	OFF
Comfort indices	settings
Solve Specific humidity	OFF
Solve smoke mass fraction	OFF
Solution control / Extra variables	settings
InForm - Group 7	Edit InForm 7
InForm - Group 8	Edit InForm 8


Domain Settings
Geometry
Models
Properties
Initialisation
Help
Top menu
Sources
Numerics
Output
Total number of iterations
3000
Minimum number of iterations
1
Maximum runtime
Unlimited
Global convergence criterion
0.100000
%
Relaxation control
Iteration control
Limits on Variables
Differencing Schemes
Multi-Grid Accelerator - MIGAL
Edit InForm Group
15
16
17
18
Convergence accelerator for highly compressible flow:
DENPCO
More...
Page Dn
Line Dn

Run-solver
进入计算



计算过程当中将出现如下对话框显示计算状态

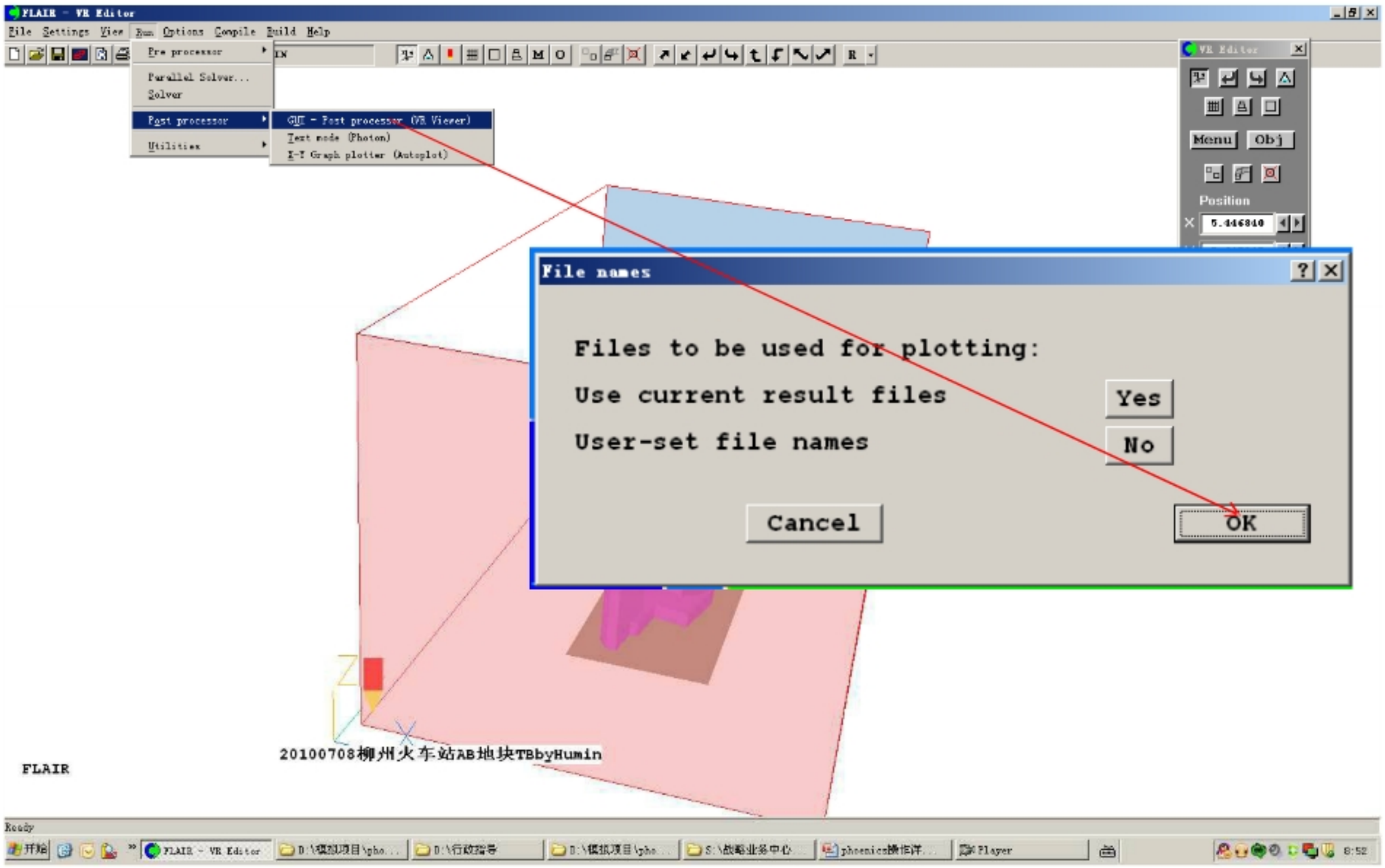


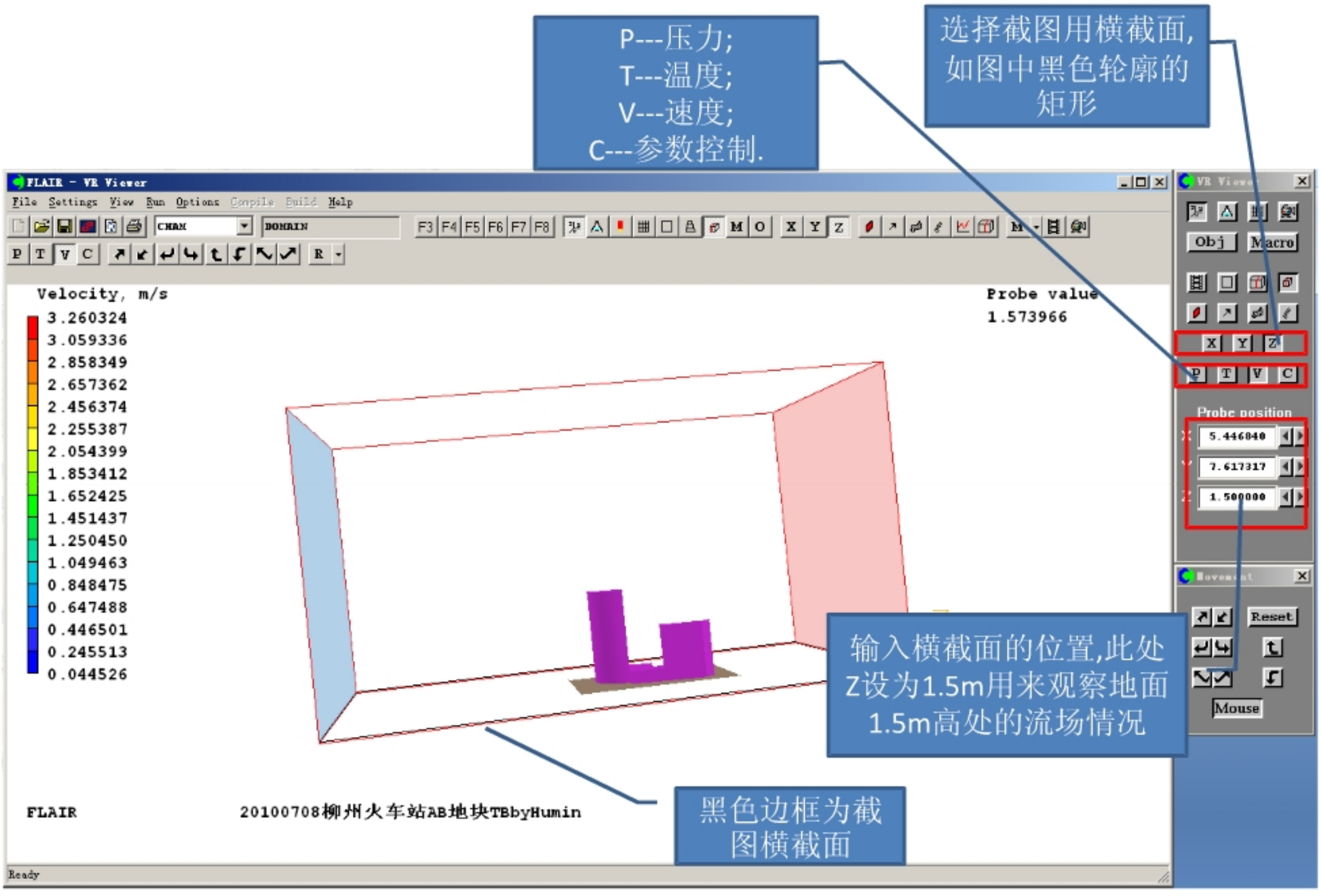
鼠标在此供停留数秒将出现此红色进度条

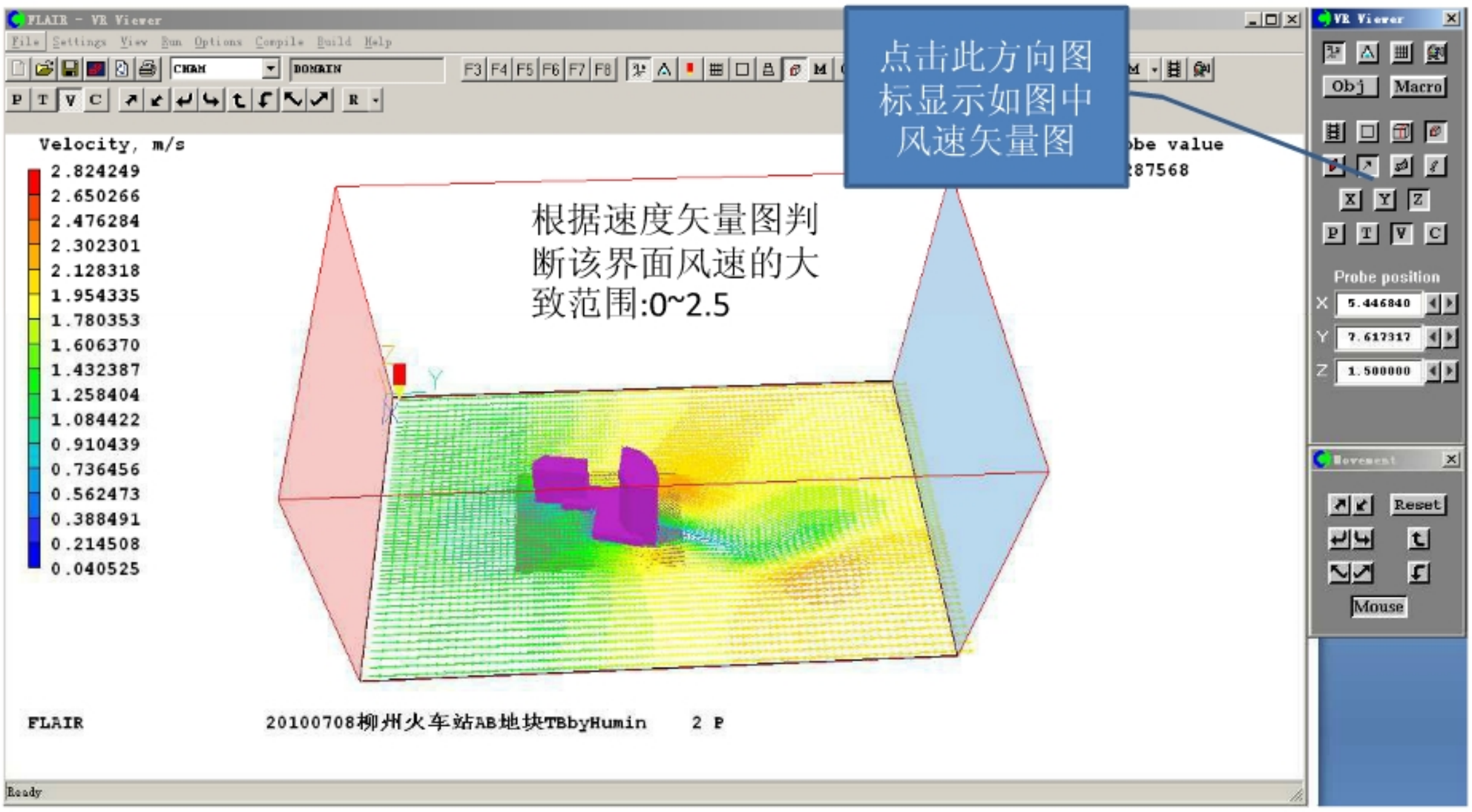


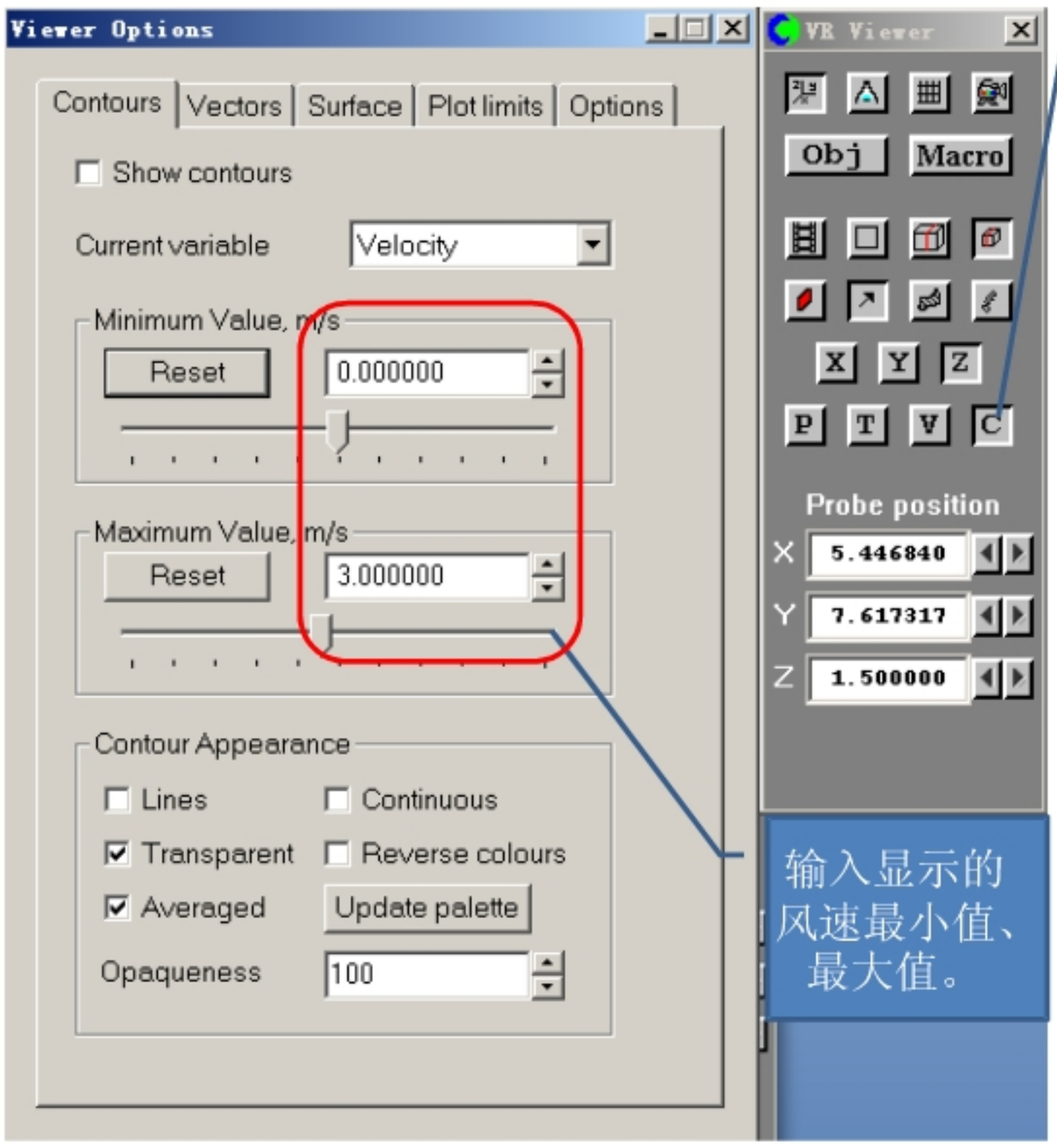
计算未完成但收敛良好的情况下可中途停止计算，方法如下：
1.按键盘任一键;
2.鼠标点击视图中的”Endjob”.

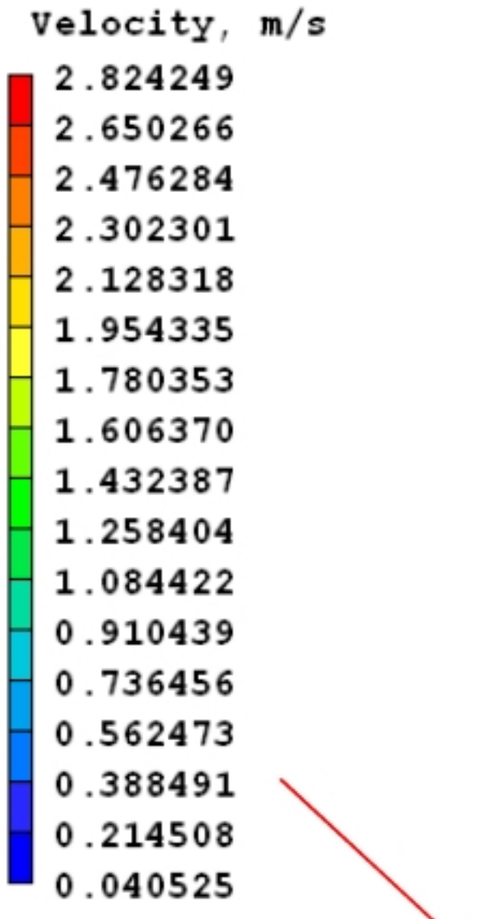
查看结果


FLAIR - VR Editor
File Settings View Run Options Compile Build Help
Pre processor
Parallel Solver...
Solver
Post processor
Utilities
GUI - Post processor (VR Viewer)
Text mode (Photon)
X-Y Graph plotter (Autoplot)
VR Editor
Menu
Obj
Position
5.446840
File names
Files to be used for plotting:
Use current result files
Yes
User-set file names
No
Cancel
OK
20100708柳州火车站AB地块TBbyHumin
FLAIR
Ready

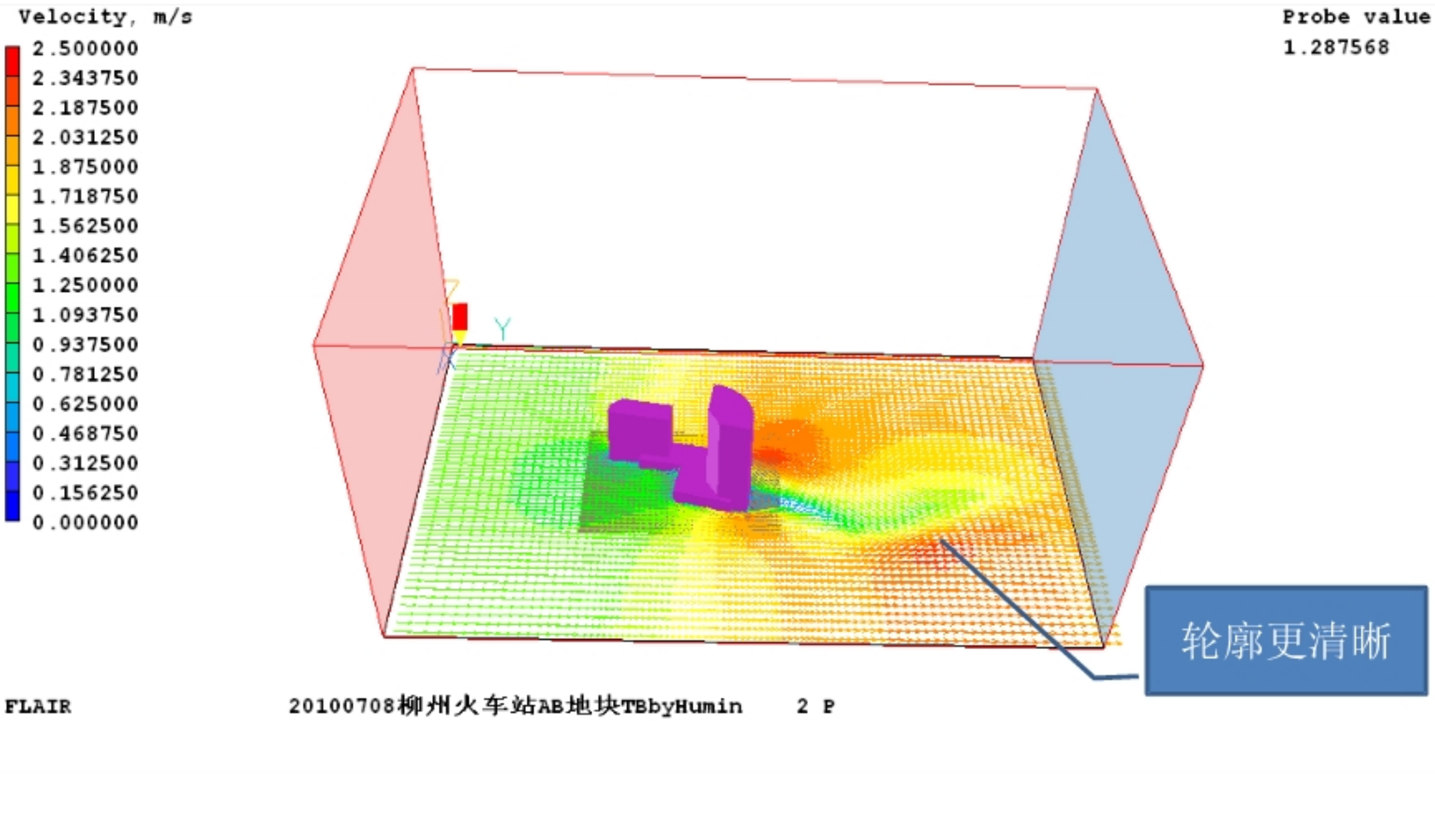

P---压力;
T---温度;
V---速度;
C---参数控制.
选择截图用横截面,如图中黑色轮廓的矩形
FLAIR - VR Viewer
File Settings View Run Options Compile Build Help
CHAN
DOMAIN
F3 F4 F5 F6 F7 F8
M O
X Y Z
P T V C
R
Velocity, m/s
3.260324
3.059336
2.858349
2.657362
2.456374
2.255387
2.054399
1.853412
1.652425
1.451437
1.250450
1.049463
0.848475
0.647488
0.446501
0.245513
0.044526
Probe value
1.573966
VR Viewer
Obj
Macro
X Y Z
P T V C
Probe position
5.446840
7.617317
1.500000
Reset
Mouse
输入横截面的位置,此处Z设为1.5m用来观察地面1.5m高处的流场情况
黑色边框为截图横截面
FLAIR
20100708柳州火车站AB地块TBbyHumin
Ready


FLAIR - VR Viewer
File Settings View Run Options Compile Build Help
CHAN
DOMAIN
F3 F4 F5 F6 F7 F8
P T V C
R
Velocity, m/s
2.824249
2.650266
2.476284
2.302301
2.128318
1.954335
1.780353
1.606370
1.432387
1.258404
1.084422
0.910439
0.736456
0.562473
0.388491
0.214508
0.040525
点击此方向图标显示如图中风速矢量图
根据速度矢量图判断该界面风速的大致范围:0~2.5
FLAIR
20100708柳州火车站AB地块TBbyHumin
2 P
Ready
VR Viewer
Obj
Macro
X Y Z
P T V C
Probe position
X 5.446840
Y 7.617317
Z 1.500000
Movement
Reset
Mouse

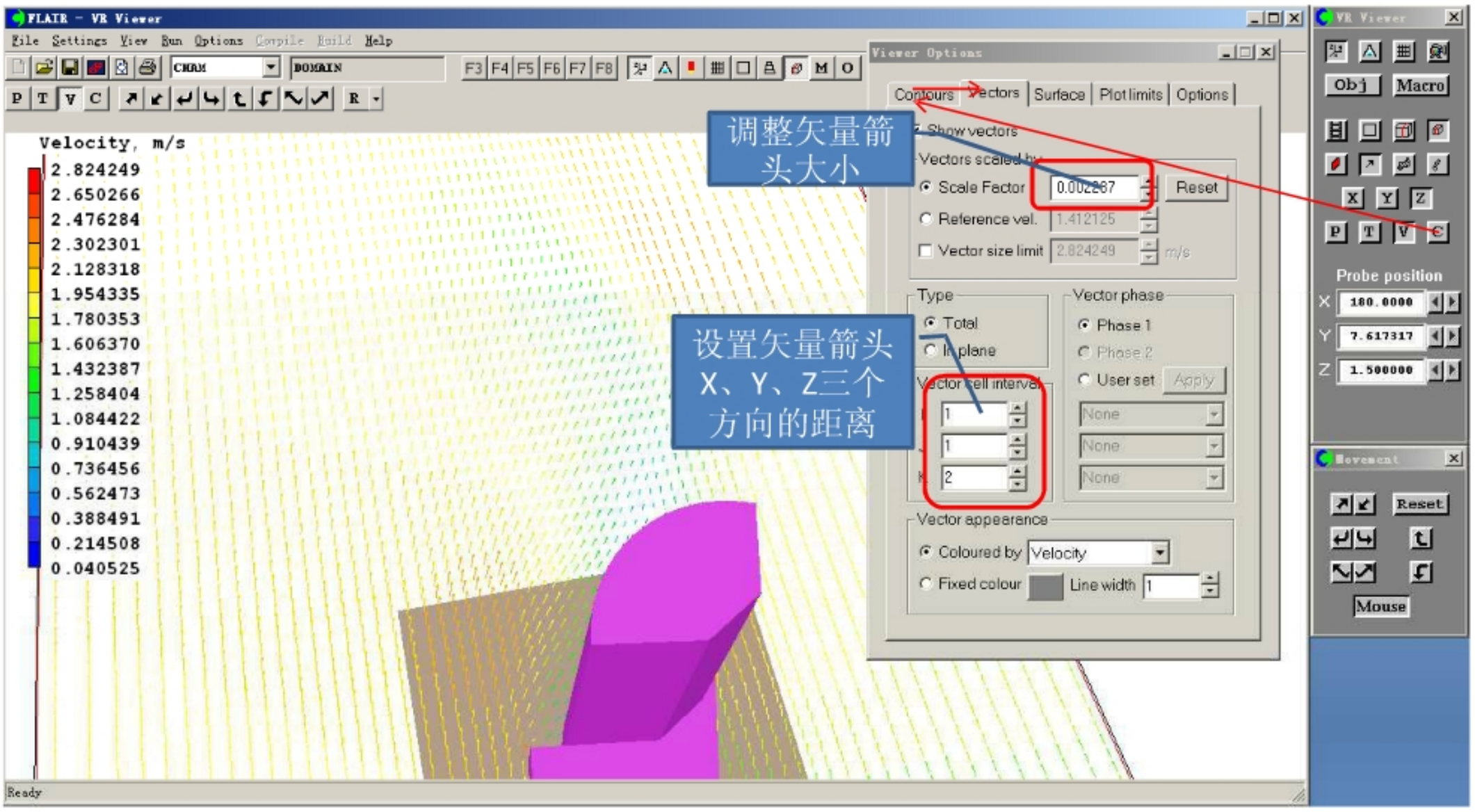

Viewer Options
Contours
Vectors
Surface
Plot limits
Options
Show contours
Current variable
Velocity
Minimum Value, m/s
Reset
0.000000
Maximum Value, m/s
Reset
3.000000
Contour Appearance
Lines
Continuous
Transparent
Reverse colours
Averaged
Update palette
Opaqueness
100
VR Viewer
Obj
Macro
X
Y
Z
P
T
V
C
Probe position
X
5.446840
Y
7.617317
Z
1.500000
点击此处,出现左侧对话框(Viewer Options),设置风速显示范围
输入显示的风速最小值、最大值。


Velocity, m/s
2.824249
2.650266
2.476284
2.302301
2.128318
1.954335
1.780353
1.606370
1.432387
1.258404
1.084422
0.910439
0.736456
0.562473
0.388491
0.214508
0.040525
风速标尺由整个计算区域的速度值勤范围调整至设置值勤范围

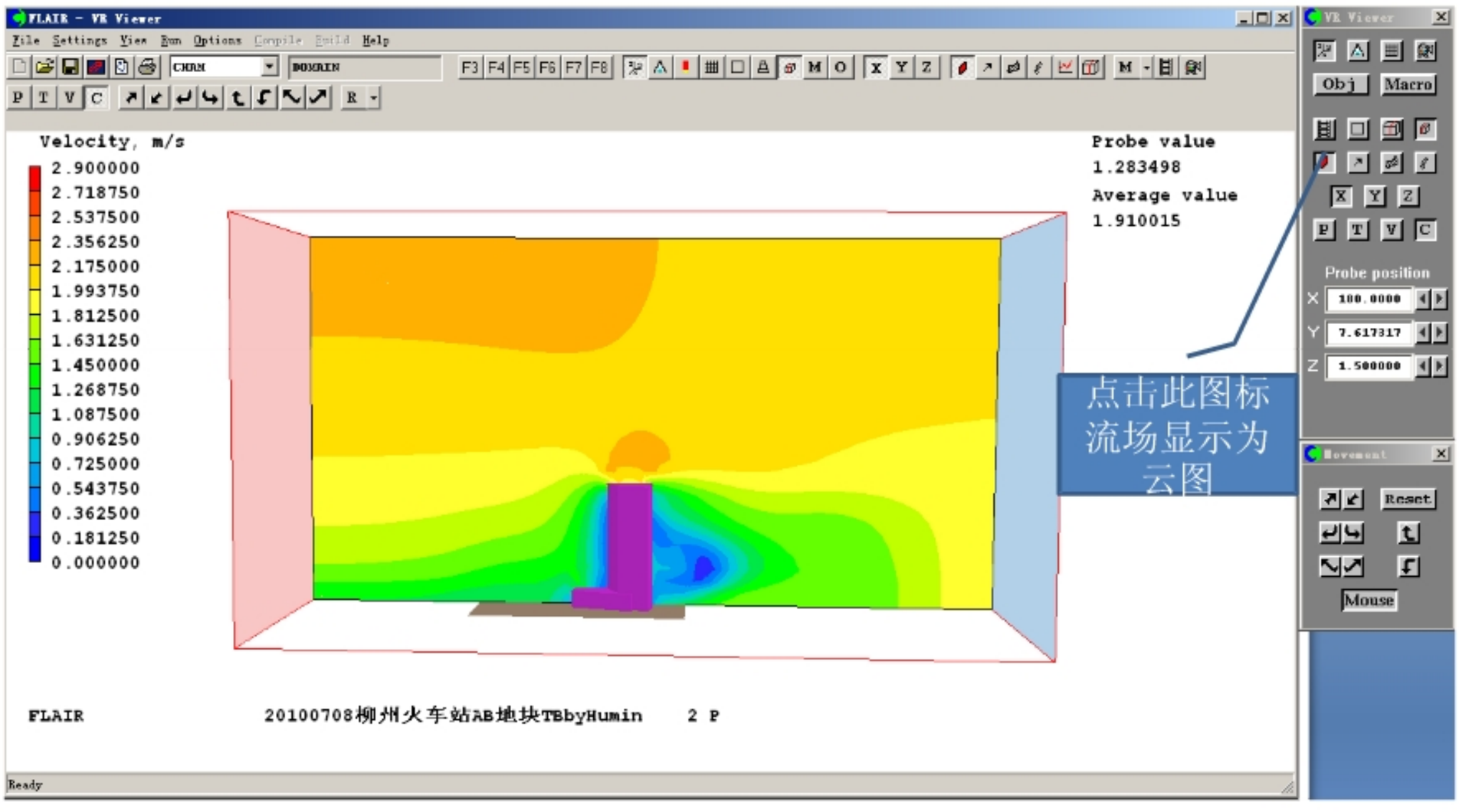
调整速度值显示范围后的效果如下图



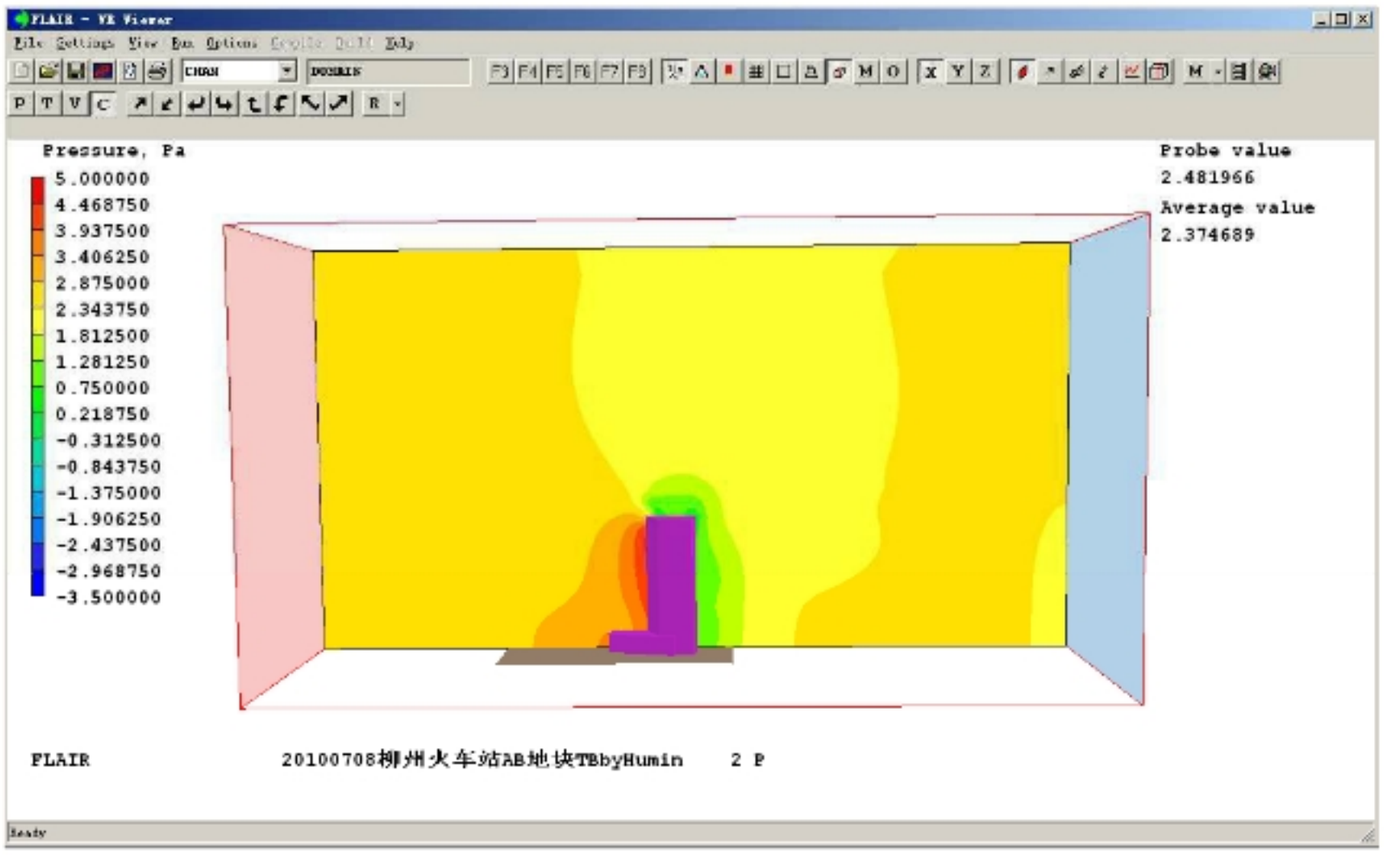
调整矢量图的疏密


FLAIR - VR Viewer
File Settings View Run Options Compile Build Help
Velocity, m/s
2.824249
2.650266
2.476284
2.302301
2.128318
1.954335
1.780353
1.606370
1.432387
1.258404
1.084422
0.910439
0.736456
0.562473
0.388491
0.214508
0.040525
调整矢量箭头大小
设置矢量箭头X、Y、Z三个方向的距离
Viewer Options
Contours
Vectors
Surface
Plot limits
Options
Show vectors
Vectors scaled by
Scale Factor
0.002267
Reset
Reference vel.
1.412125
Vector size limit
2.824249
m/s
Type
Total
In plane
Vector phase
Phase 1
Phase 2
User set
Apply
Vector cell interval
1
1
2
None
None
None
Vector appearance
Coloured by
Velocity
Fixed colour
Line width
1
VR Viewer
Obj
Macro
X
Y
Z
P
T
V
C
Probe position
180.0000
7.617317
1.500000
Movement
Reset
Mouse
Ready

同理，截取X轴180m处的截面观察来流风绕过建筑的流场变化情况

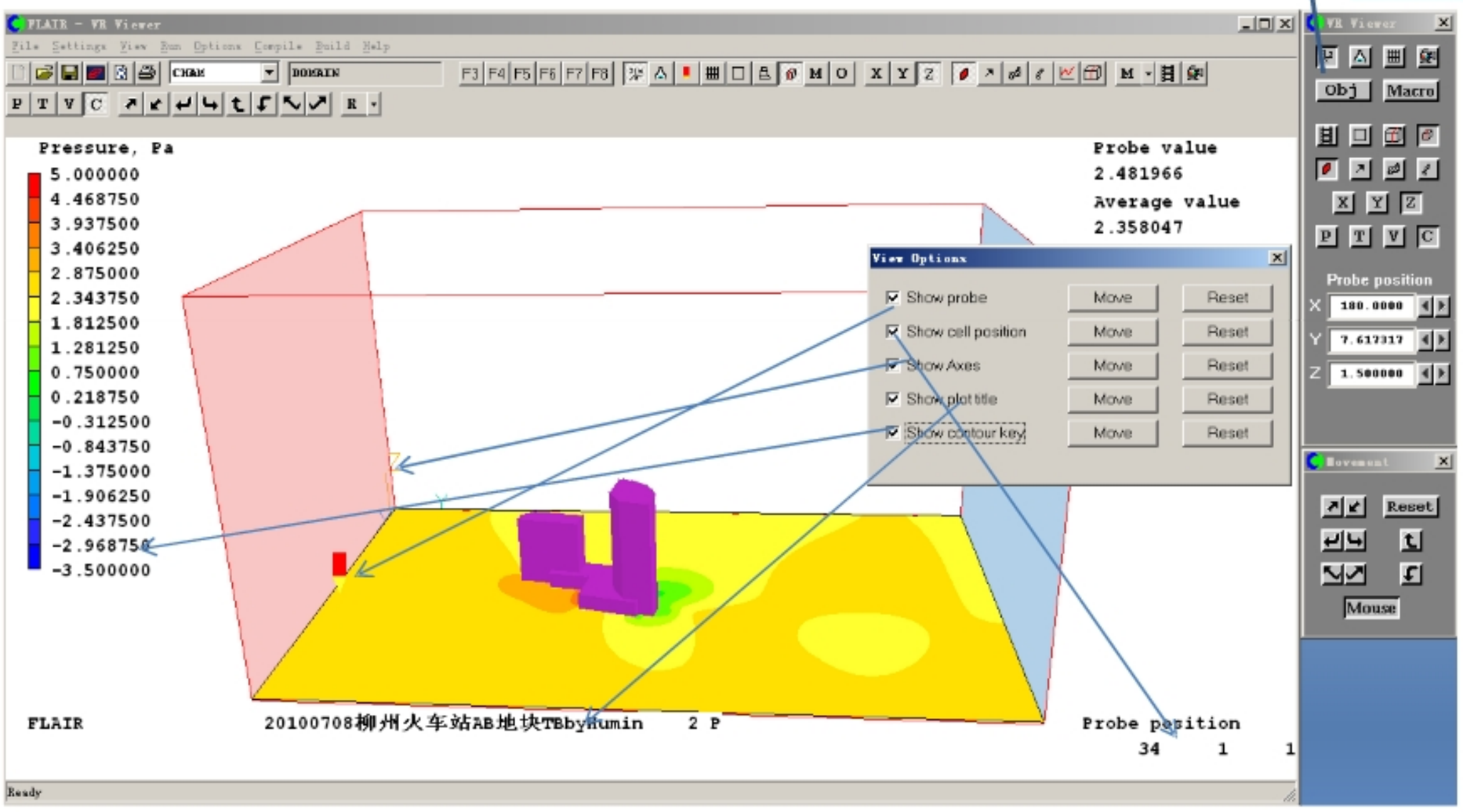


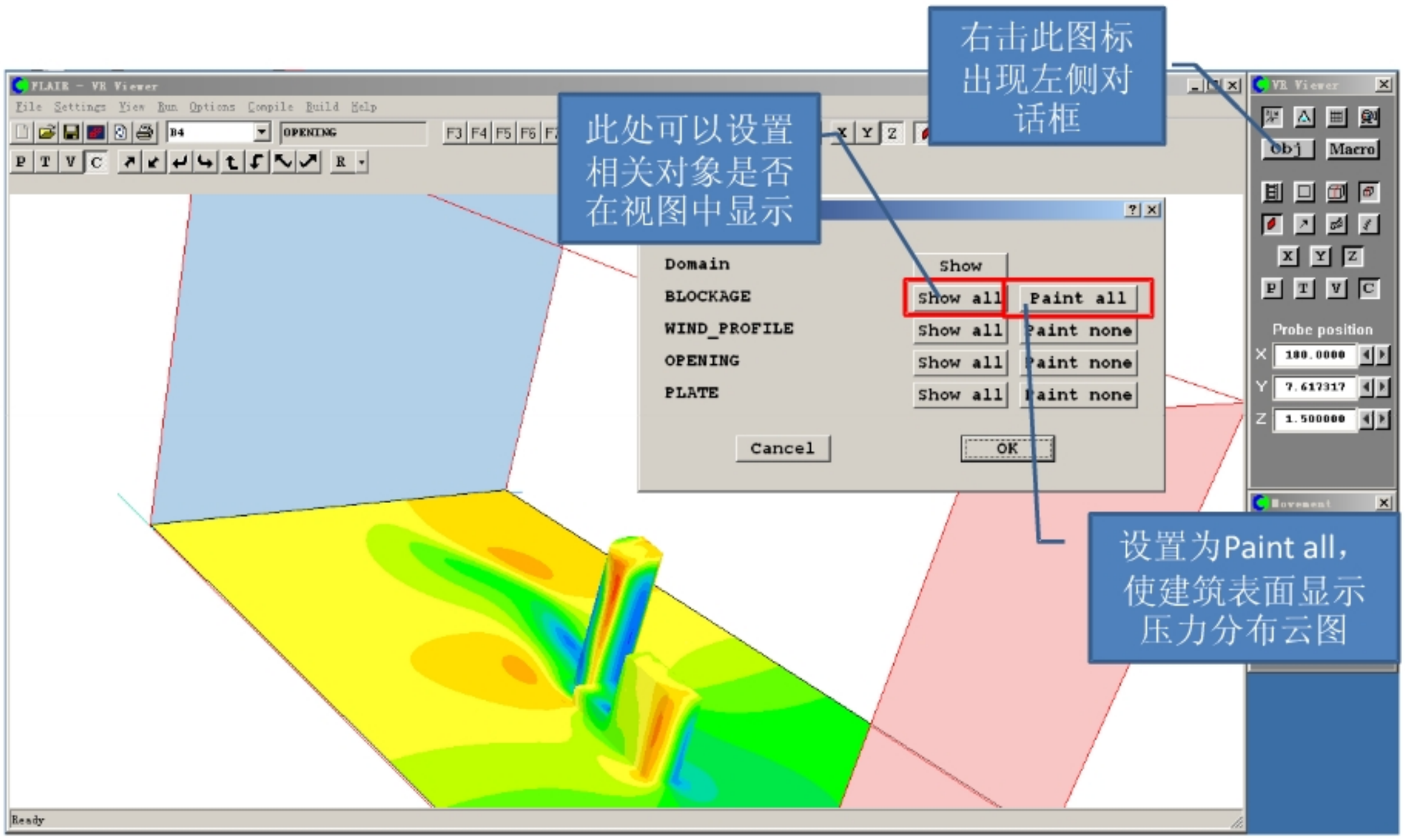
同理，截取不同截面观察建筑周边压力的变化情况



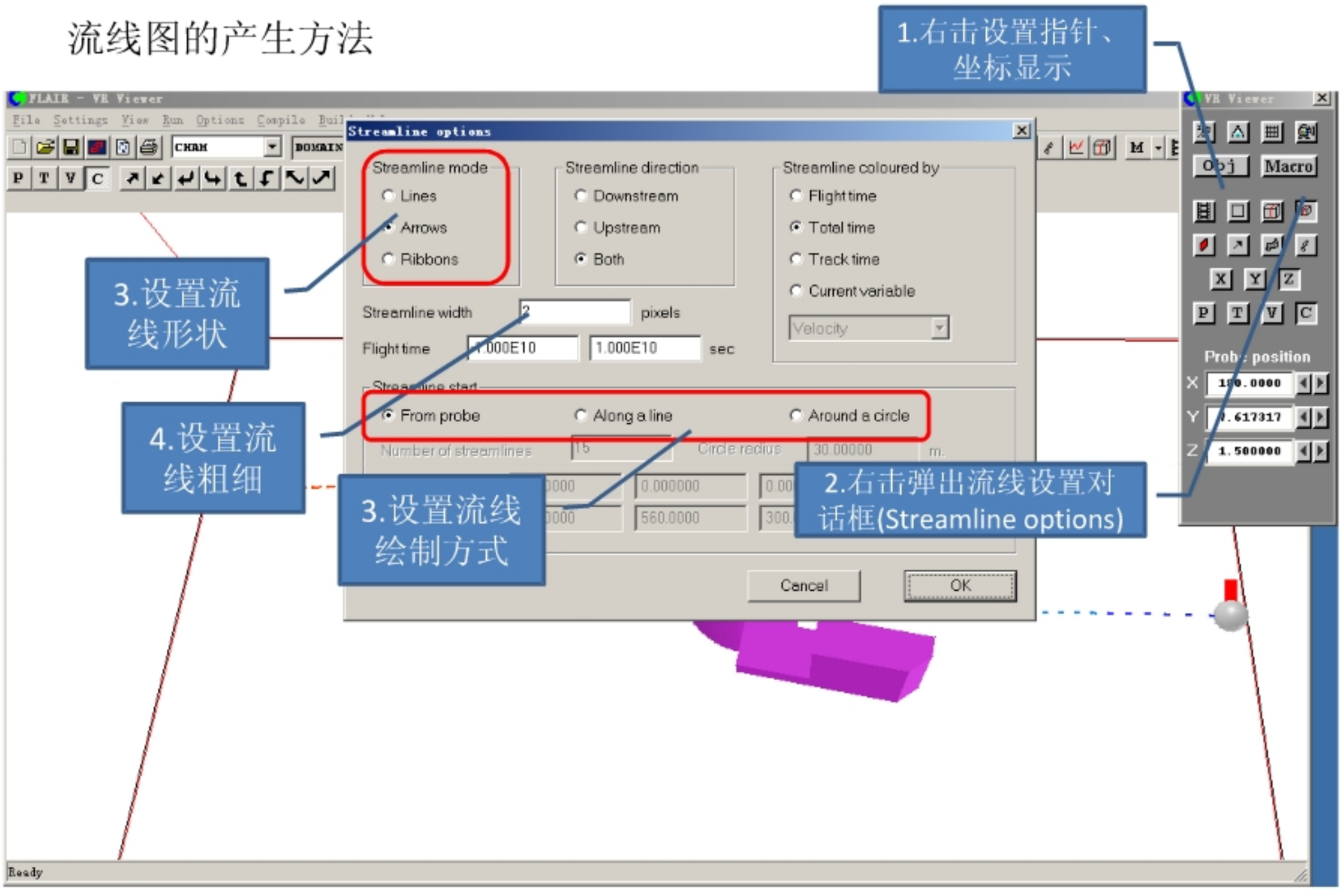
图形界面元素显示选择

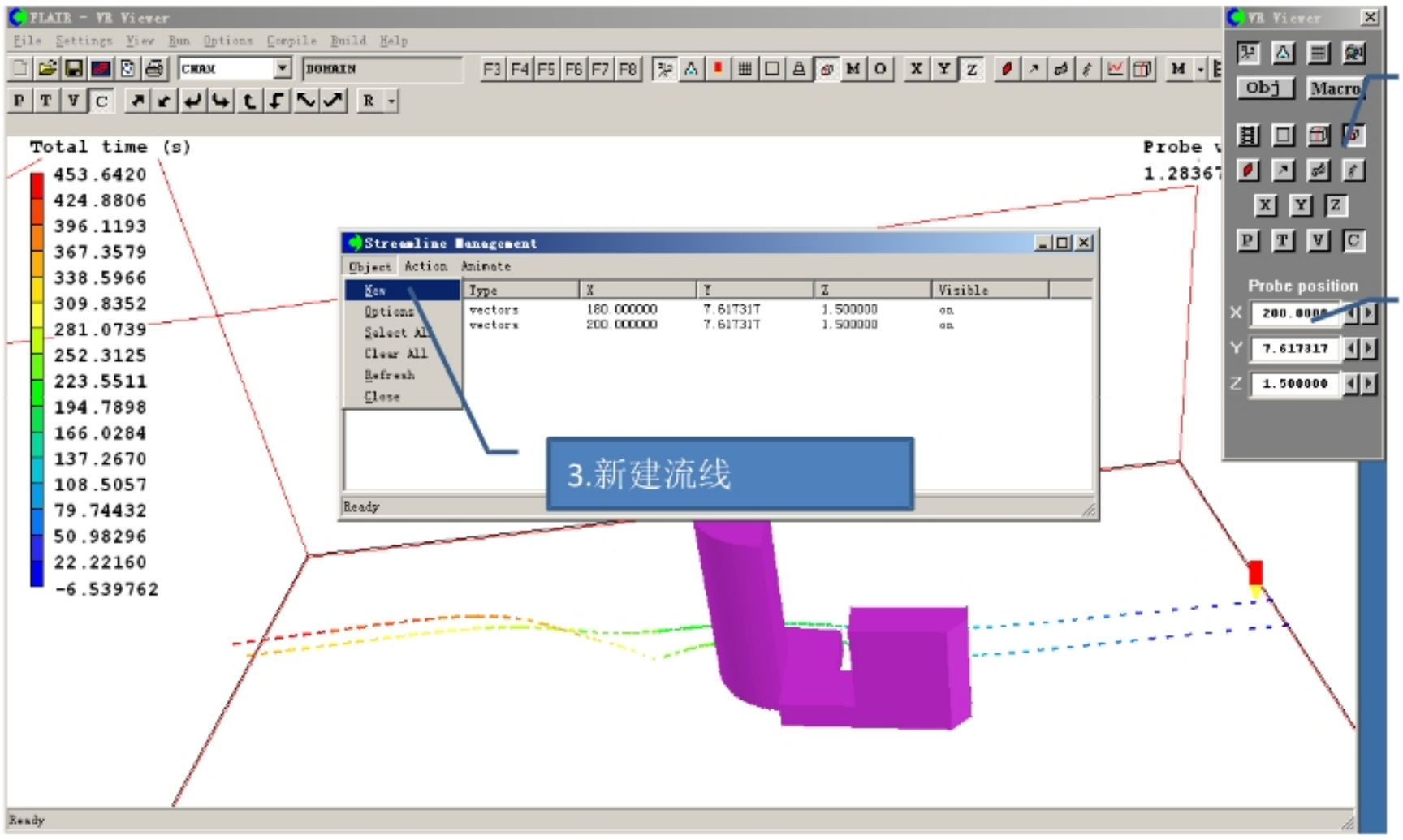
右击此键，弹出View Options对话框架，设置图中相关元素是否需要显示。




右击此图标
出现左侧对
话框
此处可以设置
相关对象是否
在视图中显示
FLAIR - VR Viewer
File Settings View Run Options Compile Build Help
B4
OPENING
F3 F4 F5 F6
X Y Z
P T V C
R
Domain
Show
BLOCKAGE
Show all
Paint all
WIND_PROFILE
Show all
Paint none
OPENING
Show all
Paint none
PLATE
Show all
Paint none
Cancel
OK
VR Viewer
Obj
Macro
X Y Z
P T V C
Probe position
X 180.0000
Y 7.617317
Z 1.500000
设置为Paint all，
使建筑表面显示
压力分布云图
Ready

流线图的产生方法


1.右击设置指针、坐标显示
3.设置流线形状
4.设置流线粗细
3.设置流线绘制方式
2.右击弹出流线设置对话框(Streamline options)
Streamline options
Streamline mode
Lines
Arrows
Ribbons
Streamline direction
Downstream
Upstream
Both
Streamline coloured by
Flight time
Total time
Track time
Current variable
Velocity
Streamline width
pixels
Flight time
sec
From probe
Along a line
Around a circle
Number of streamlines
Circle radius
m.
Cancel
OK
VR Viewer
Obj
Macro
Probe position
X
Y
Z
Ready



1.左键单击此流线绘制图标出现Streamline Management对话框

2.调整指针位置作为流线绘制起点

易犯错误

1. 请根据项目地点来设置风速大小及方向，勿将所有模拟的风速和大小都设置成深圳的；

2. GEOMETRY里有一个设置为STEADY，千万勿设置成TRANSIENT；

计算中途保存前做的工作,设置完后保存—正常计算--

