低速湍流平板算例计算步骤

1. 网格转换：

在总控文件 key.hypara 中设置任务类型为网格转换

```
int    nsimutask      = 1;
string parafilename   = "./bin/grid_para.hypara";
```

并在网格控制文件 grid_para.hypara 中设置网格参数

```
int gridtype   = 1;
int axisup     = 1;
int from_gtype = 3;
string from_gfile = "./grid/mesh0_545x385_plate.grd";
string out_gfile  = "./grid/mesh0_545x385_plate.fts";
```

双击运行 PHengLEIv3d0.exe 即可得到转换后的网格文件

mesh0_545x385_plate.grd	2021/3/5 8:06	GRD 文件	4,918 KB
mesh0_545x385_plate.inp	2021/3/5 8:06	INP 文件	1 KB
mesh0_545x385_plate_0.bcmesh	2021/3/26 7:51	BCMESH 文件	8,255 KB
mesh0_545x385_plate_0.bcname	2021/3/26 7:51	BCNAME 文件	1 KB
mesh0_545x385_plate_0.fts	2021/3/26 7:51	FTS 文件	4,932 KB
mesh0_545x385_plate_0.link	2021/3/26 7:51	LINK 文件	1 KB

2. 边界条件：

网格生成完毕，包含网格边界条件信息的 boundary_condition.hypara 文件

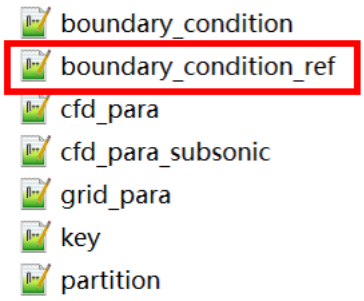
也随之生成

```
int nBoundaryConditons = 5;
string bcName = "SOLID_SURFACE";
{
  int bcType = 2;
}
string bcName = "SYMMETRY";
{
  int bcType = 3;
}
string bcName = "FARFIELD";
{
  int bcType = 4;
}
string bcName = "INFLOW";
{
  int bcType = 5;
}
string bcName = "OUTFLOW";
{
  int bcType = 6;
}
```

在新生成的 boundary_condition.hypara 文件中，修改入口边界为总温总压入口类型 52，出口边界为压力出口类型 62，并设置相关参数

```
string bcName = "INFLOW";
{
  int bcType = 52;
  double totalPressure = 118309.784;
  double totalTemperature = 302.4;
  double direction_inlet[] = 1, 0, 0;
}
string bcName = "OUTFLOW";
{
  int bcType = 62;
  double staticPressure = 115056.0;
}
```

（bin 文件夹中的 boundary_condition_ref.hypara 文件为已经设置好的参考边界条件参数，用户可参照该文件对新生成的 boundary_condition.hypara 文件进行修改）



3. 网格分区：

在总控文件 key.hypara 中修改参数，设置任务类型为网格分区

```
int    nsimutask      = 3;
string parafilename   = "./bin/partition.hypara";
```

并在网格分区文件 partition.hypara 中设置网格参数

```
int pgridtype = 1;
int maxproc   = 4;

string original_grid_file  = "./grid/mesh0_545x385_plate.fts";
string partition_grid_file = "./grid/mesh0_545x385_plate__4.fts";
int numberOfMultigrid = 1;
```

双击运行 PHengLEIv3d0.exe 即可得到分区后的网格文件

mesh0_545x385_plate__4_0.fts	2021/3/26 8:06	FTS 文件	5,000 KB
mesh0_545x385_plate__4_0.link	2021/3/26 8:06	LINK 文件	1 KB

4. 运行算例：

在总控文件 key.hypara 中修改参数，设置任务类型为数值计算

```
int  ndim        = 2;
int  nparafile   = 1;
int    nsimutask         = 0;
string parafilename      = "./bin/cfd_para_subsonic.hypara";
```

修改对应结算器 cfd_para_subsonic 文件中的主要计算参数

```
int maxSimuStep       = 100000;

int intervalStepFlow  = 2000;
int intervalStepPlot  = 2000;
int intervalStepForce = 200;
int intervalStepRes   = 20;
int ifLowSpeedPrecon = 0;

double refMachNumber = 0.2;
double attackd       = 0.00;
double angleSlide    = 0.00;

int inflowParaType = 0;
double refReNumber = 5000000.0;
double refDimensionalTemperature = 300.00;

double gridScaleFactor = 1.0;

double forceRefenenceLengthSpanWise = 1.0;
double forceRefenenceLength = 1.0;
double forceRefenenceArea = 1.0;
double TorqueRefX = 0.0;
double TorqueRefY = 0.0;
double TorqueRefZ = 0.0;

int    viscousType    = 3;
string viscousName = "leq-sa";
```

cmd 进入工程目录，输入命令：mpiexec -n 4 ./PHengLEIv3d0.exe 并行执行程序