1. ~~网格更新后，程序修改在afem的Assembly Label Manager里修改Label Offset。~~
2. 车辆节数改变后，程序修改Constraint。
3. ~~Solve前，~~
   1. ~~将Output Elements输入到group ElementForResponse中；将Output Nodes输入到Group NodeForResponse中。~~
   2. ~~将expression Num\_Of\_Time\_Steps的值设置到Time\_Step的Number of Time Steps中。~~
   3. ~~根据Output Nodes for Noise修改Noise\_Structure\_Output的Enable VELOCITY Request。~~
4. ~~Excitation Input中缺少界面惯性矩和横截面面积的expression定义，需要处理单位转换（base unit to SI unit）。~~
5. ~~Nastran dat采用mm - milli-newton单位。~~
6. ~~Excitation.exe计算完后检查计算是否成功？~~
7. ~~Read\_excitation.exe输入文件，rail nodes sequence。文件名excitation\_nodes.dat，文件格式：~~

*~~$Rail Node Label Sequence~~*

*~~13~~*

*~~25~~*

*~~32~~*

1. ~~Read\_excitation.exe计算完后检查计算是否成功？成功后将结果文件force.dat, moment.dat, dload.dat复制到工程文件夹下。~~
2. 调用nastran求解。解析f06结果或pch结果。
   1. 解析structure output。
      1. ~~提取D I S P L A C E M E N T V E C T O R，Time-T1-T2-T3-R1生成afu record。Record name：Displacement-NodeID-X/Y/Z~~
      2. ~~提取A C C E L E R A T I O N V E C T O R，Time-T1-T2-T3生成afu record。Record name：Acceleration-NodeID-X/Y/Z~~
      3. 提取S T R E S S E S I N B E A M E L E M E N T S, Time-SXC-生成afu record。Record Name: Stress-ElementID-NodeID(Grid)-SXC
   2. ~~解析noise output。~~
3. ~~提取V E L O C I T Y V E C T O R，Time-T1/T2/T3, Time-SXC-生成afu record。Record Name: Velocity- NodeID-X/Y/Z~~
4. ~~按照Node几何空间以给定顺序存入afu。~~

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8 | 9 | 10 | 11 | 12 | 13 | 14 |

X

Z

1. 计算noise。选择计算点(落在隧道空腔内，输入数量控制)，输出相对坐标，相对平面中心点（只计算第一部分）。
   1. ~~对<prjName>\_noise\_time-velocity.afu进行FFT变换，生成node\*.dat。文件格式：~~

*~~Total Point Count: 2021~~*

*~~X Value Real Imaginary~~*

*~~1. 0.000000E+000 -2.835952E-004 0.000000E+000~~*

*~~2. 4.949270E-001 6.034958E-003 5.952143E-004~~*

*~~3. 9.898539E-001 6.402297E-004 7.574751E-003~~*

*~~4. 1.484781E+000 2.258011E-002 1.394601E-004~~*

*~~5. 1.979708E+000 5.840640E-004 -2.278144E-002~~*

* 1. ~~坐标输入。文件名output\_point.dat，格式：~~

*~~$ Relative Coordinate~~*

*~~$ Index X Y Z~~*

*~~1 1.0 1.0 1.0~~*

*~~2 2.1 2.2 1.0~~*

1. ~~noise.exe计算完后检查计算是否成功？~~
2. ~~提取noise.exe的output，生成<prjName>\_noise.afu。文件名Rail\_Noise\_Time\*\*.out。文件格式：~~

*~~HEIGHT = 3.00000000000000~~*

*~~Time Sound Pressure(decibal)~~*

*~~0.00202050 78.13139343~~*

*~~0.00404100 81.24166870~~*

*~~0.00606150 78.35054779~~*

*~~0.00808200 82.25679016~~*

1. 求解计算的多线程调用

TODO:

~~1. renew base model.~~

2. Merge duplicate nodes. Only merge necessary.

3. Update constraint of beam.

4. Set scratch dir before solving nastran.

5. merge duplicate nodes before solving.

6. set sim part as display part before solving noise.

7. add restriction to output point.