

進捗報告

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We are engineer groups specialized in CAE !

発表内容

- solidDisplacementFoam解析について
- 質問事項

solidDisplacementFoam

- 選択が自由な熱拡散と熱応力をもった線形弾性や固体の微小ひずみの非定常分離有限体積ソルバ

解析条件

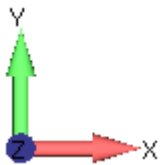
圧力5MPa

変位測定位置

応力測定位置

X方向並進拘束

Y方向並進拘束

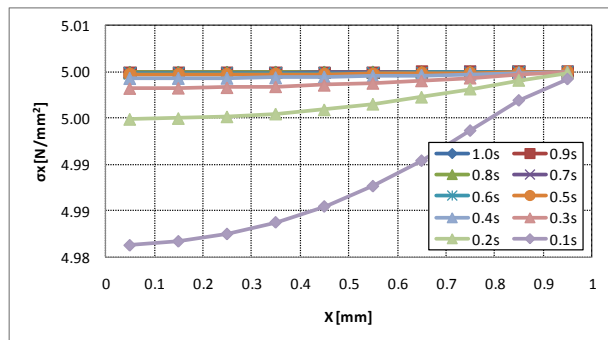


ヤング率: 250000MPa
ポアソン比: 0.25

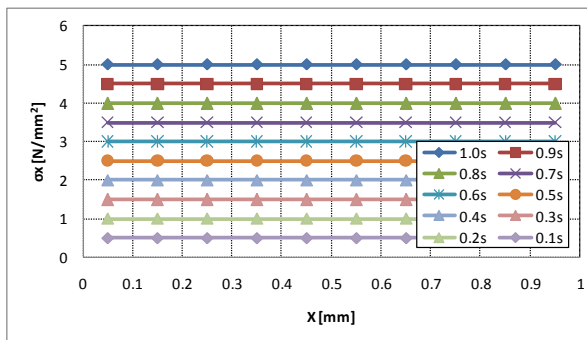
解析ソルバー
OpenFOAM
ABAQUS
DYNA

平面応力（応力）

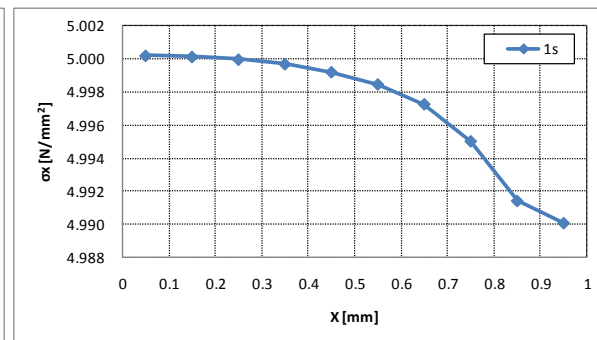
X方向応力



OpenFOAM

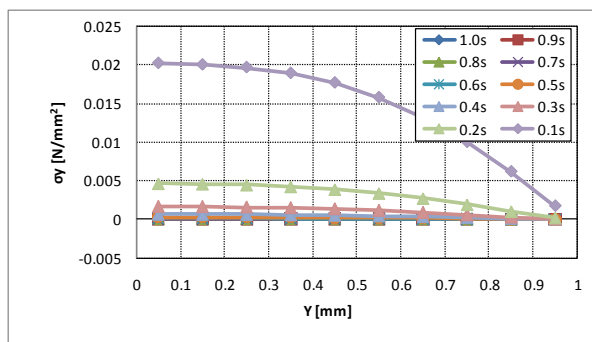


ABAQUS

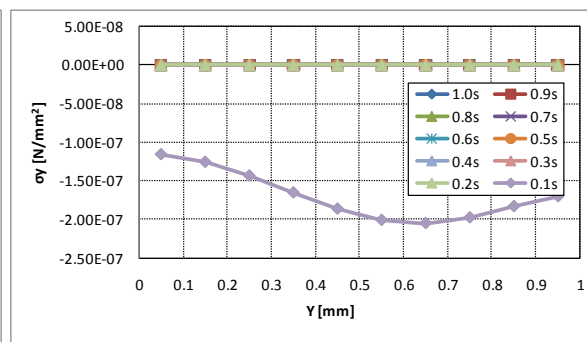


DYNA

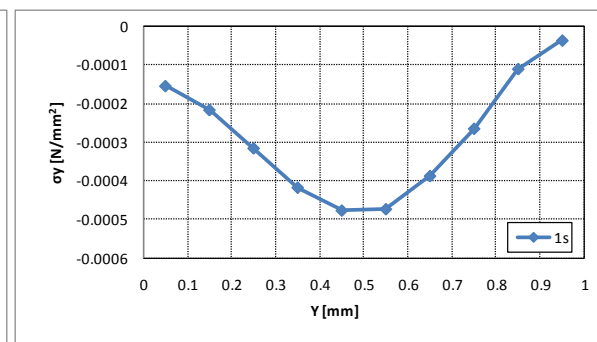
Y方向応力



OpenFOAM



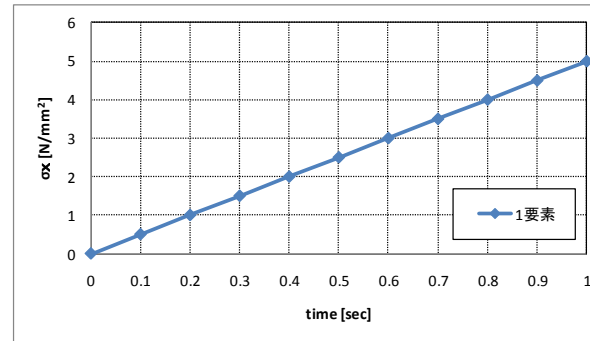
ABAQUS



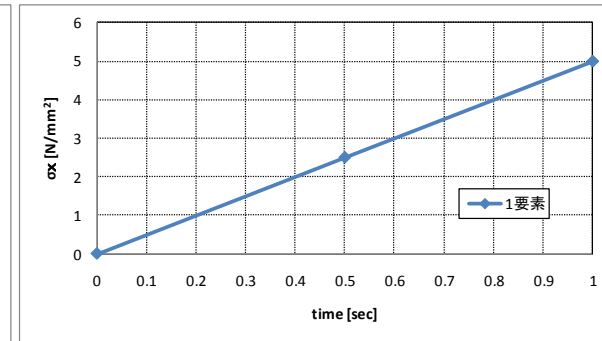
DYNA

平面応力（応力1要素）

X方向応力

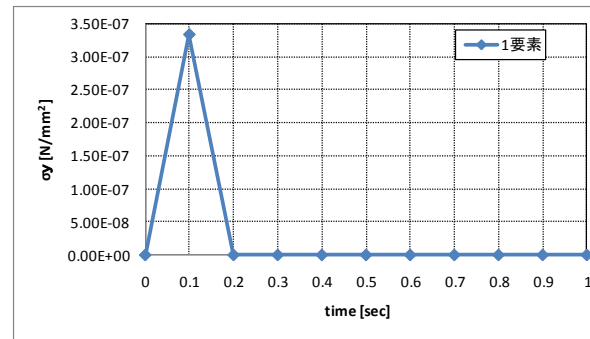


ABAQUS

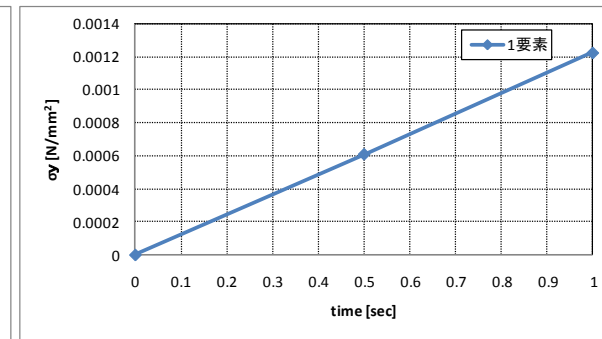


DYNA

Y方向応力



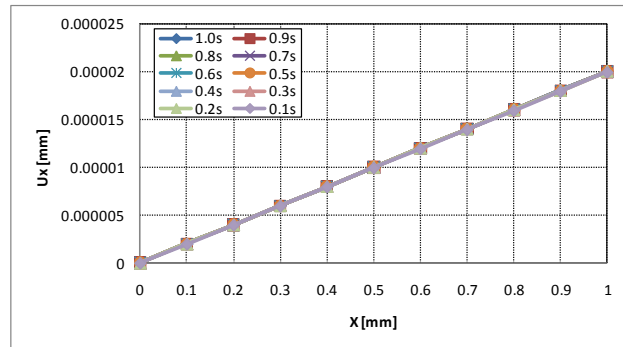
ABAQUS



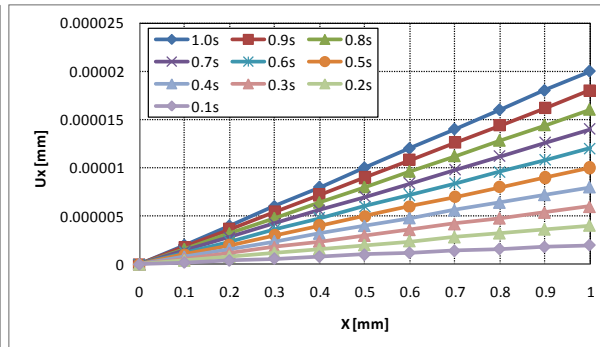
DYNA

平面応力（変位）

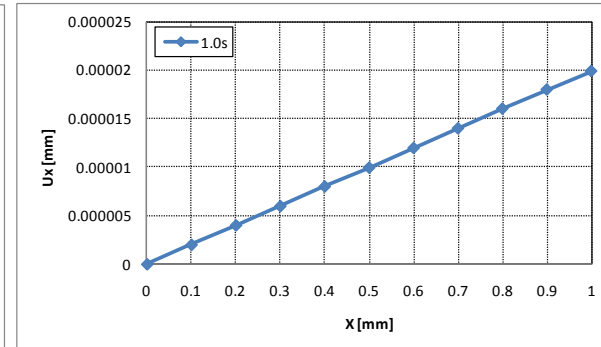
X方向応力



OpenFOAM

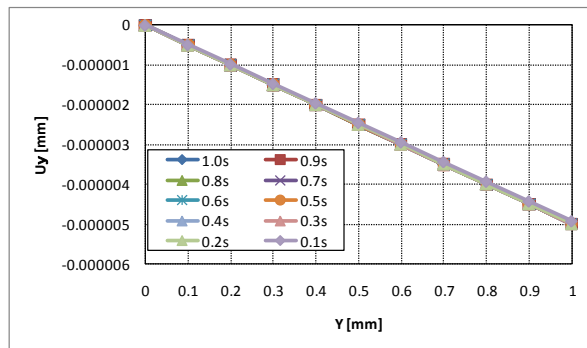


ABAQUS

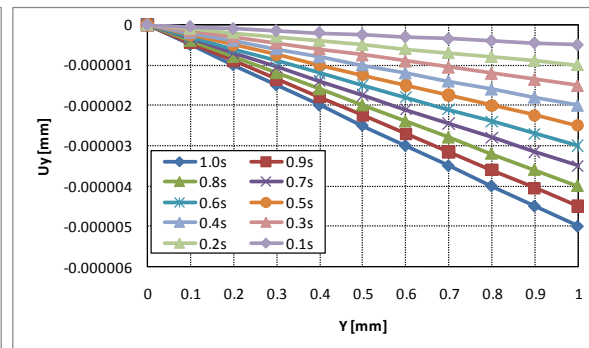


DYNA

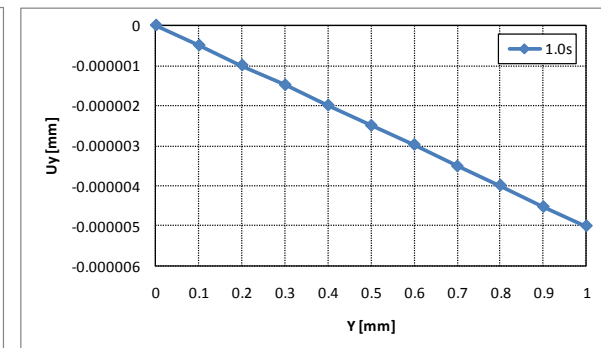
Y方向応力



OpenFOAM



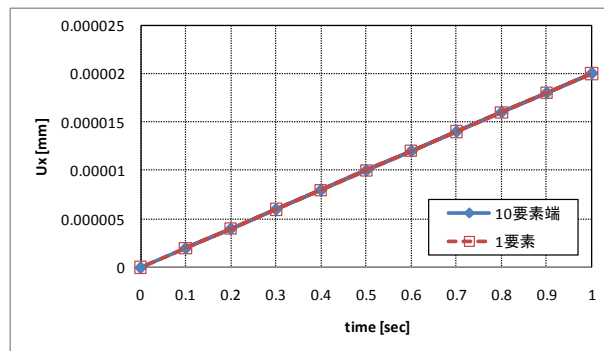
ABAQUS



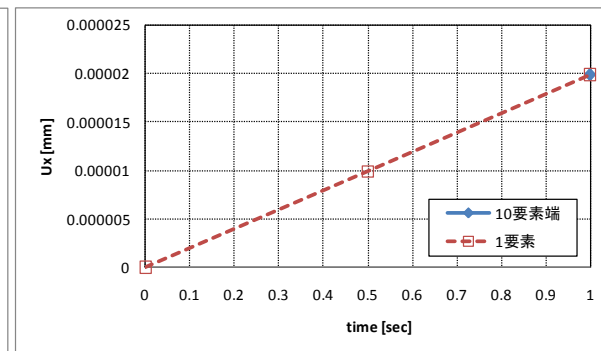
DYNA

平面応力（変位1要素）

X方向応力

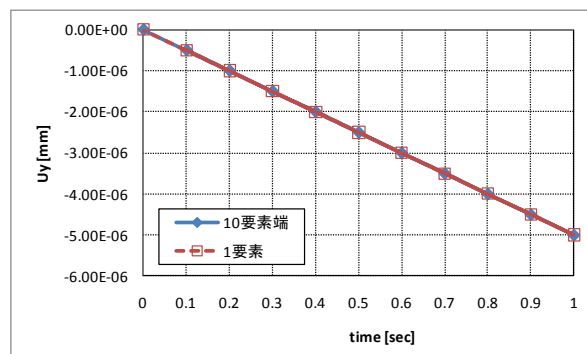


ABAQUS

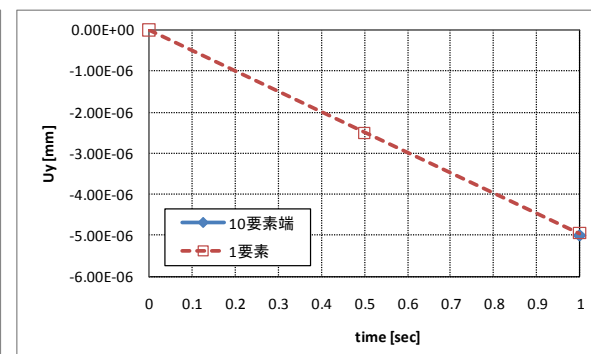


DYNA

Y方向応力



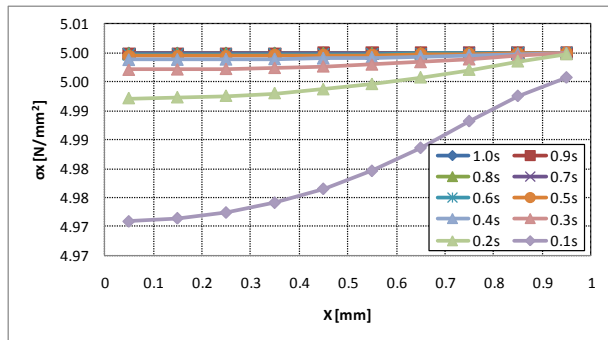
ABAQUS



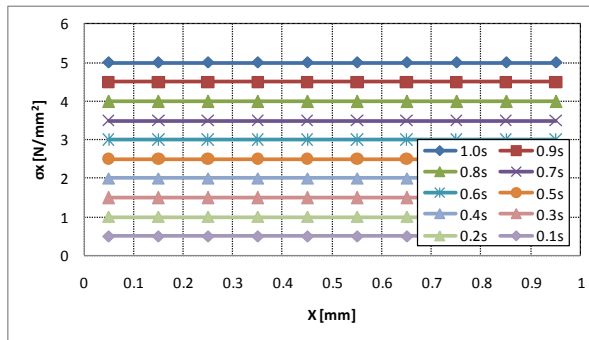
DYNA

平面ひずみ（応力）

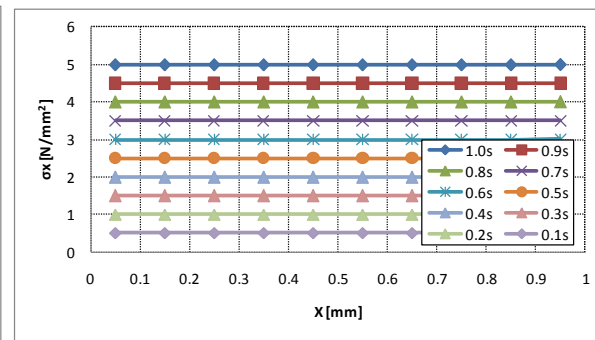
X方向応力



OpenFOAM

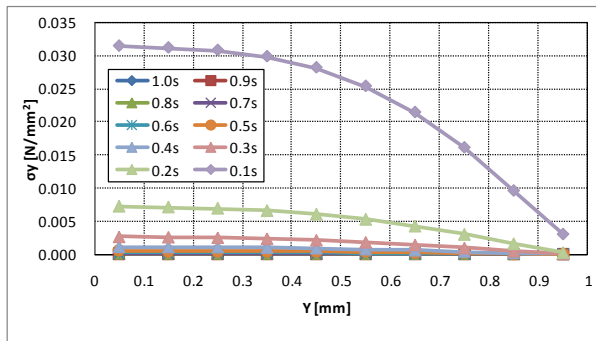


ABAQUS

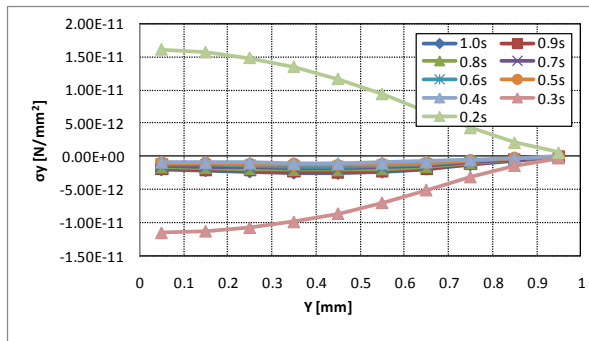


DYNA

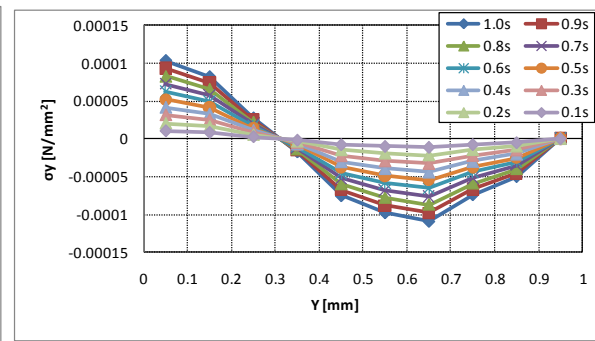
Y方向応力



OpenFOAM



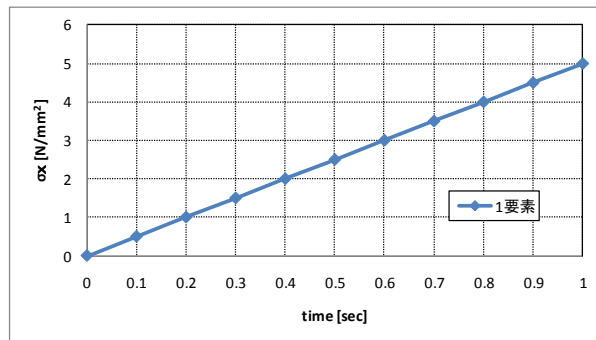
ABAQUS



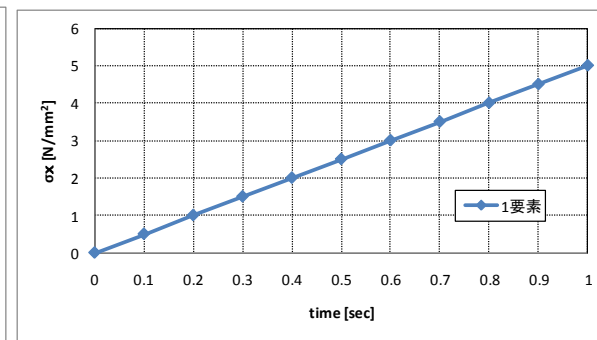
DYNA

平面ひずみ（応力1要素）

X方向応力

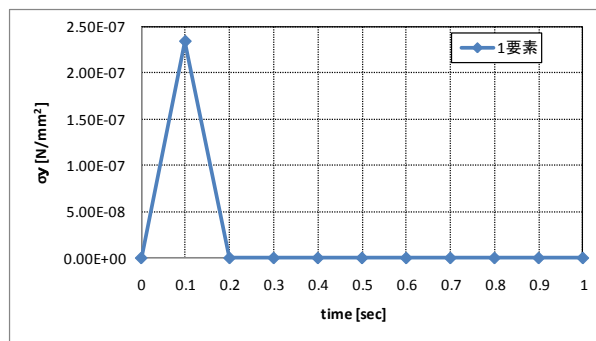


ABAQUS

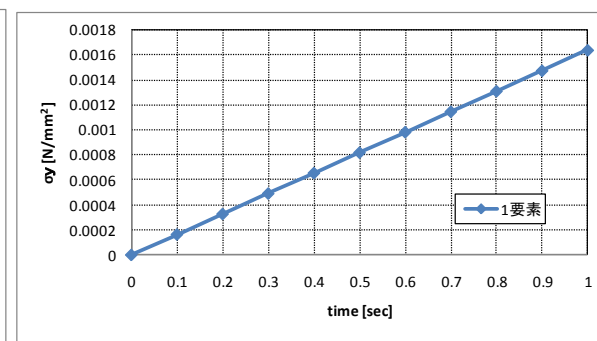


DYNA

Y方向応力



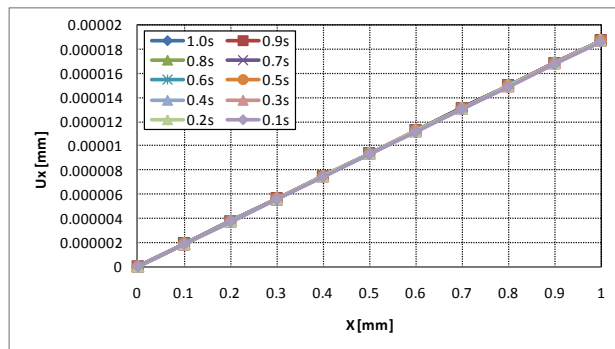
ABAQUS



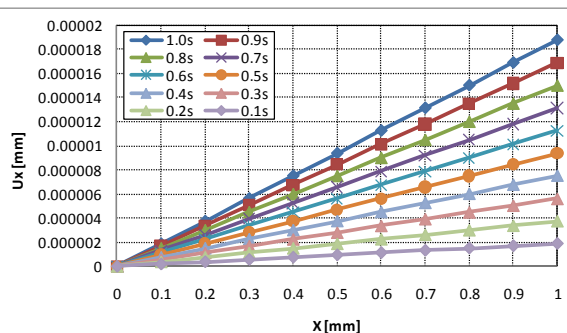
DYNA

平面ひずみ（変位）

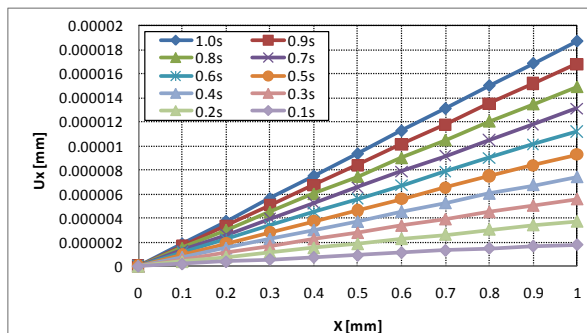
X方向応力



OpenFOAM

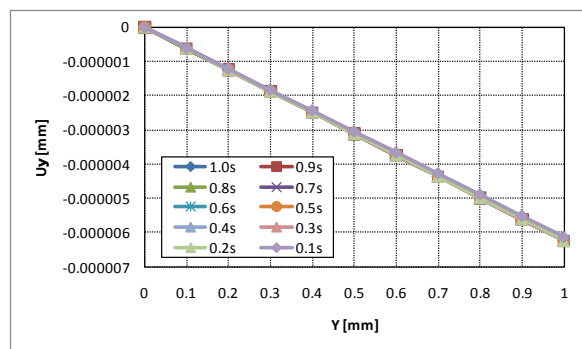


ABAQUS

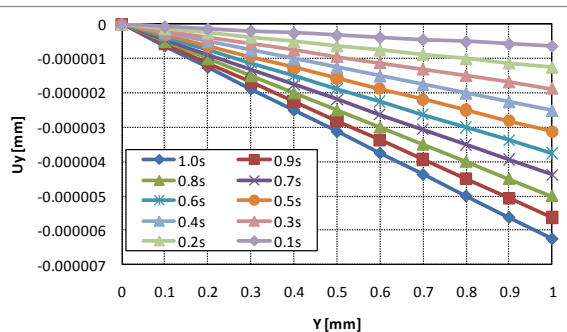


DYNA

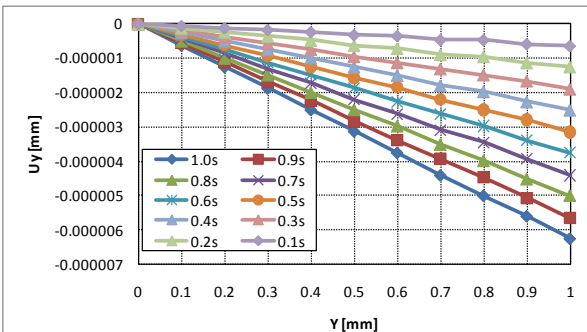
Y方向応力



OpenFOAM



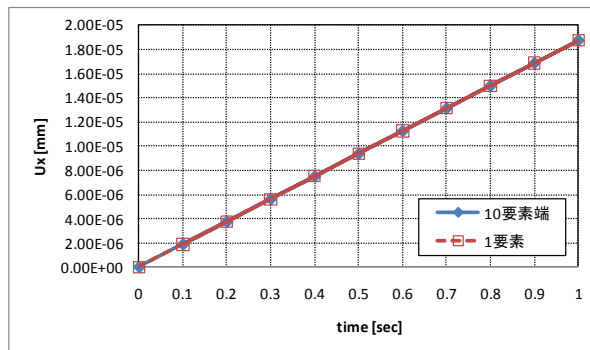
ABAQUS



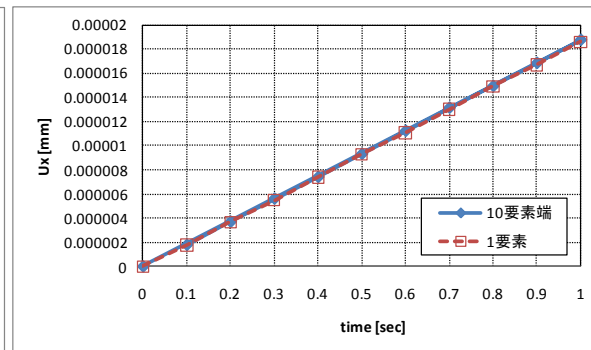
DYNA

平面ひずみ（変位1要素）

X方向応力

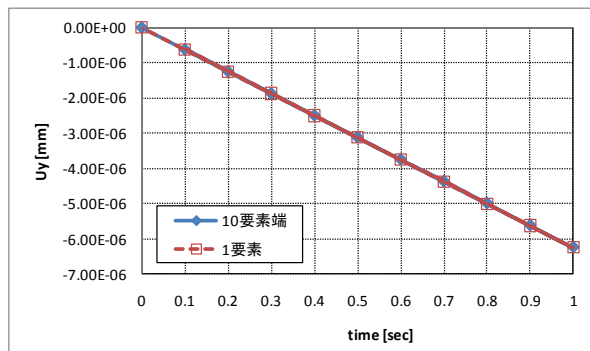


ABAQUS

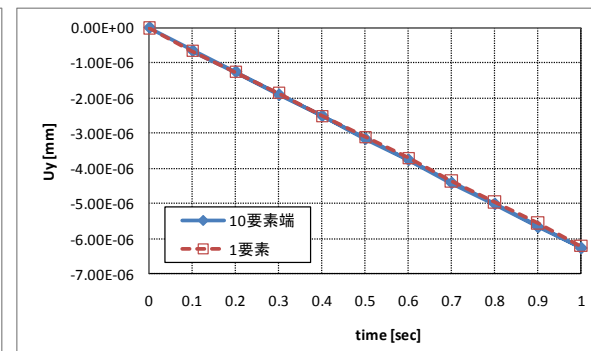


DYNA

Y方向応力

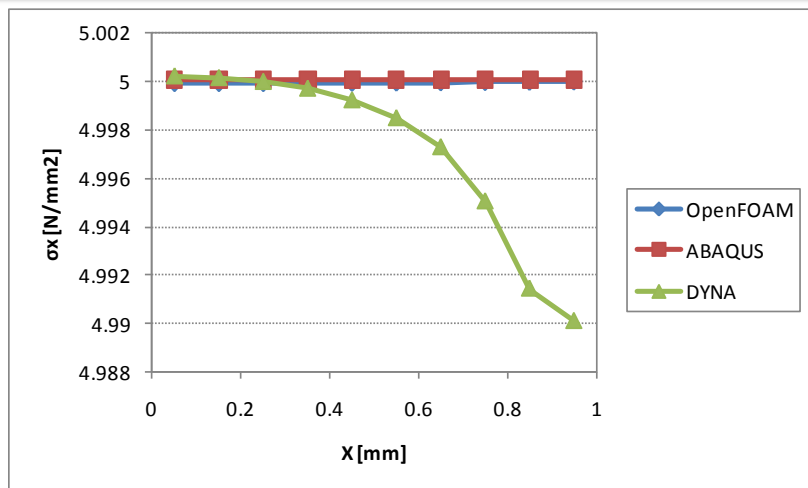


ABAQUS

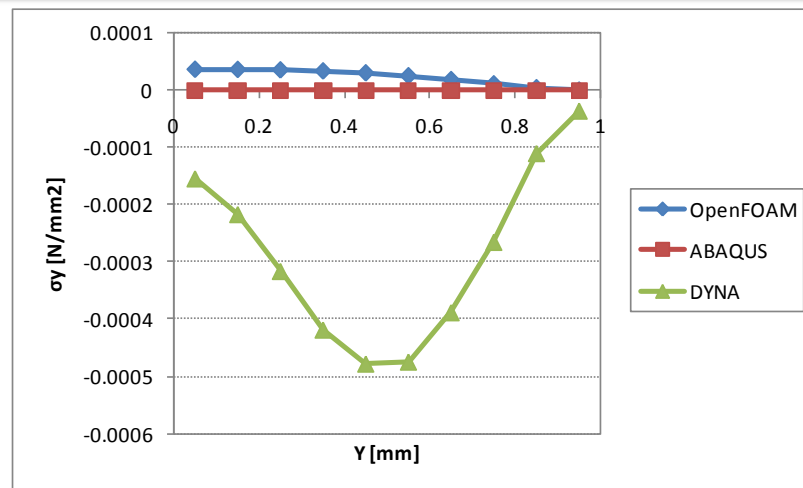


DYNA

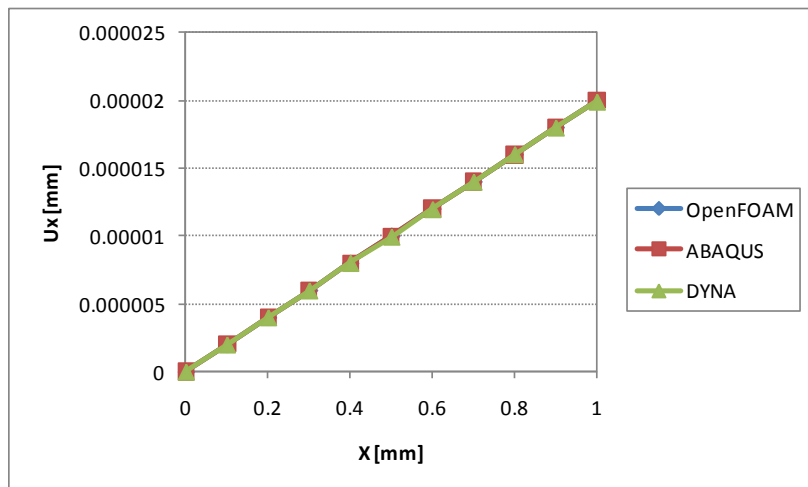
平面応力（まとめ）



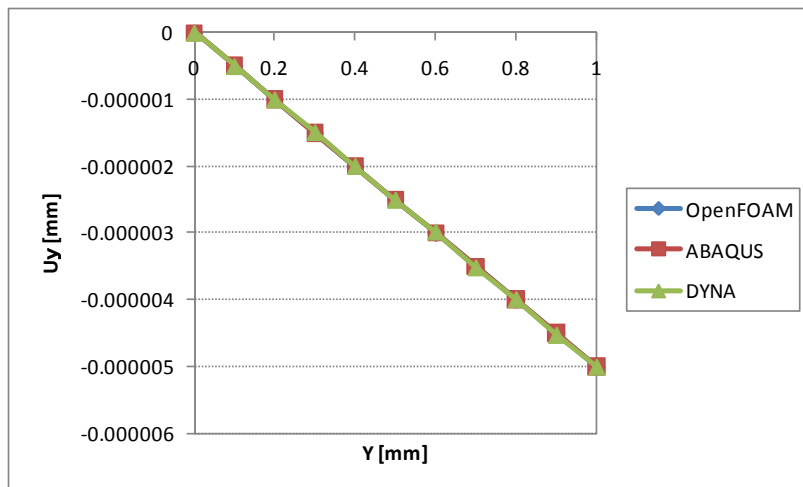
X方向応力



Y方向応力

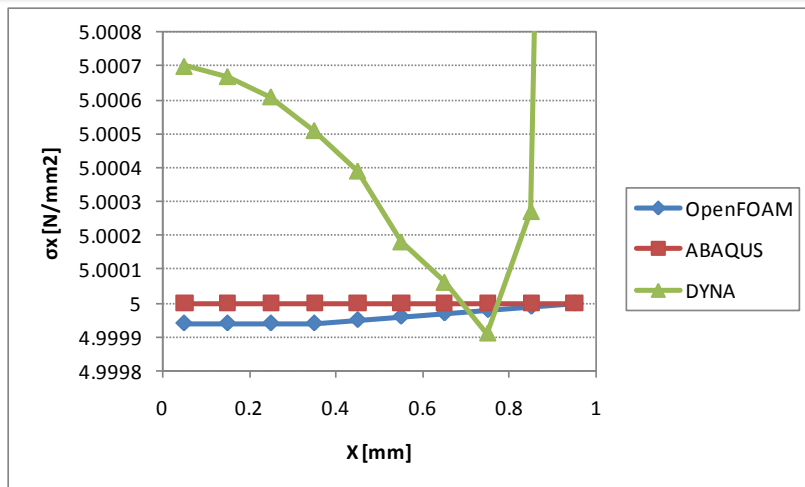


X方向変位

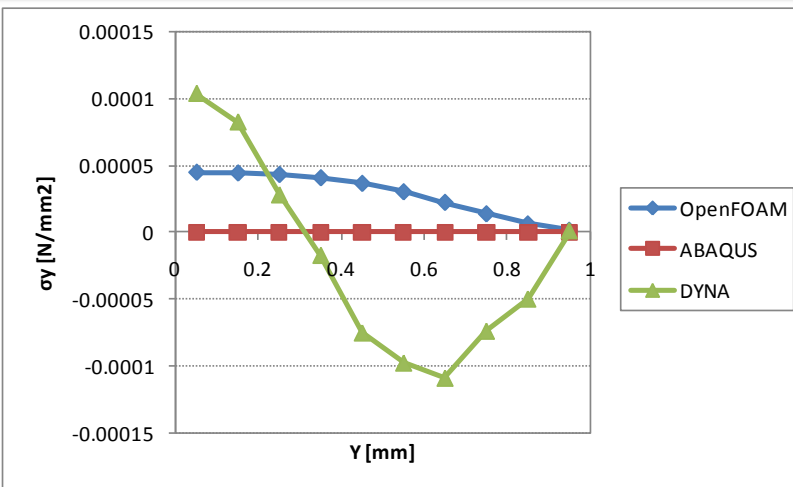


Y方向変位

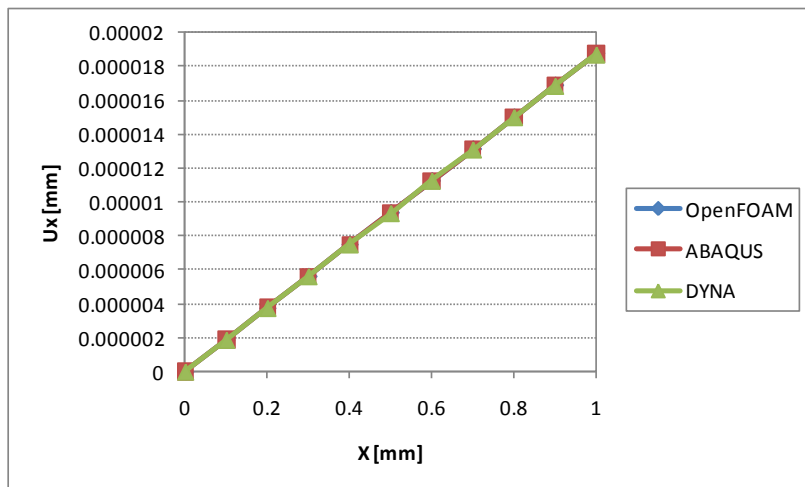
平面ひずみ（まとめ）



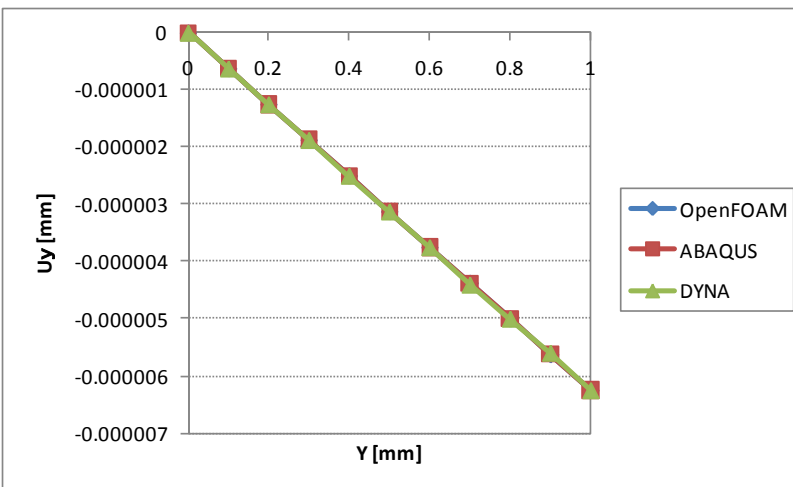
X方向応力



Y方向応力



X方向変位



Y方向変位

controlDict

```
FoamFile{  version    2.0;
           format      ascii;
           class        dictionary;
           location      "system";
           object        controlDict;
} // ***** //
```

```

application      solidDisplacementFoam;
startFrom        startTime;
startTime        0;
stopAt           endTime;
endTime          100;
deltaT           1;
writeControl      timeStep;
writeInterval     10;
purgeWrite       0;
writeFormat       ascii;
writePrecision    6;
writeCompression uncompressed;
timeFormat        general;
timePrecision     6;
graphFormat       raw;
runTimeModifiable yes;

```

←反復回数の上限

質問事項

- 強制変位の設定方法
- 3次元ソリッド計算の方法
- paraViewの奥行き表示をやめたい
- 変形図の表示方法

強制変位の設定方法

```
FoamFile{  version    2.0;
            format     ascii;
            class      volVectorField;
            object      D;}
// * * * * *
dimensions    [0 1 0 0 0 0 0];
internalField  uniform (0 0 0);
boundaryField{
left  {
    type      symmetryPlane;
}
right {
    type      tractionDisplacement;
    traction  uniform ( 5.0e6 0 0 );
    pressure  uniform 0;
    value     uniform (0 0 0);
}
```



```
FoamFile{  version    2.0;
            format     ascii;
            class      volVectorField;
            object      D;}
// * * * * *
dimensions    [0 1 0 0 0 0 0];
internalField  uniform (0 0 0);
boundaryField{
left  {
    type      symmetryPlane;
}
right {
    type      tractionDisplacement;
    traction  uniform ( 0 0 0 );
    pressure  uniform 0;
    value     uniform (2.5e-8 0 0);
}
```

3次元ソリッド計算の方法

```
FoamFile{ version 2.0;
  format  ascii;
  class   dictionary;
  location "constant";
  object  mechanicalProperties;
}
// ****
rho      rho [ 1 -3 0 0 0 0 ] 1000;
nu       nu [ 0 0 0 0 0 0 ] 0.25;
E        E [ 1 -1 -2 0 0 0 ] 2.5e+11;
planeStress yes;
```



```
FoamFile{ version 2.0;
  format  ascii;
  class   dictionary;
  location "constant";
  object  mechanicalProperties;
}
// ****
rho      rho [ 1 -3 0 0 0 0 ] 1000;
nu       nu [ 0 0 0 0 0 0 ] 0.25;
E        E [ 1 -1 -2 0 0 0 ] 2.5e+11;
planeStress;
```

paraViewの表示

