snappyHexMesh の新機能紹介

オープンCAE学会
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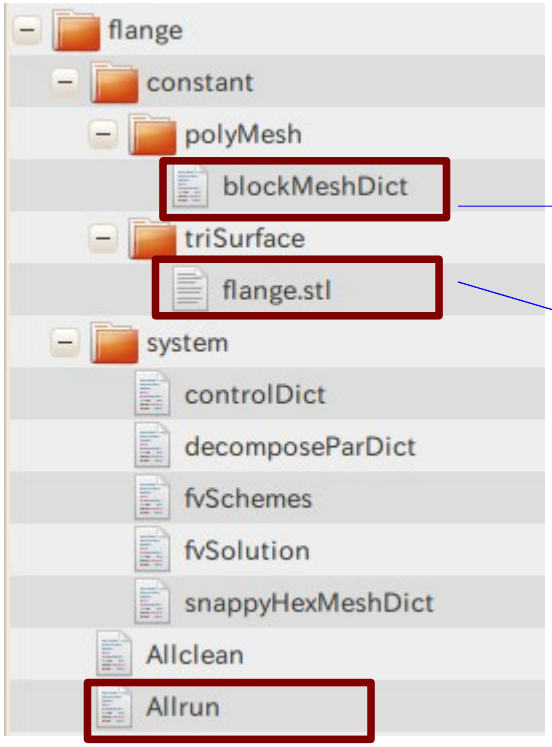
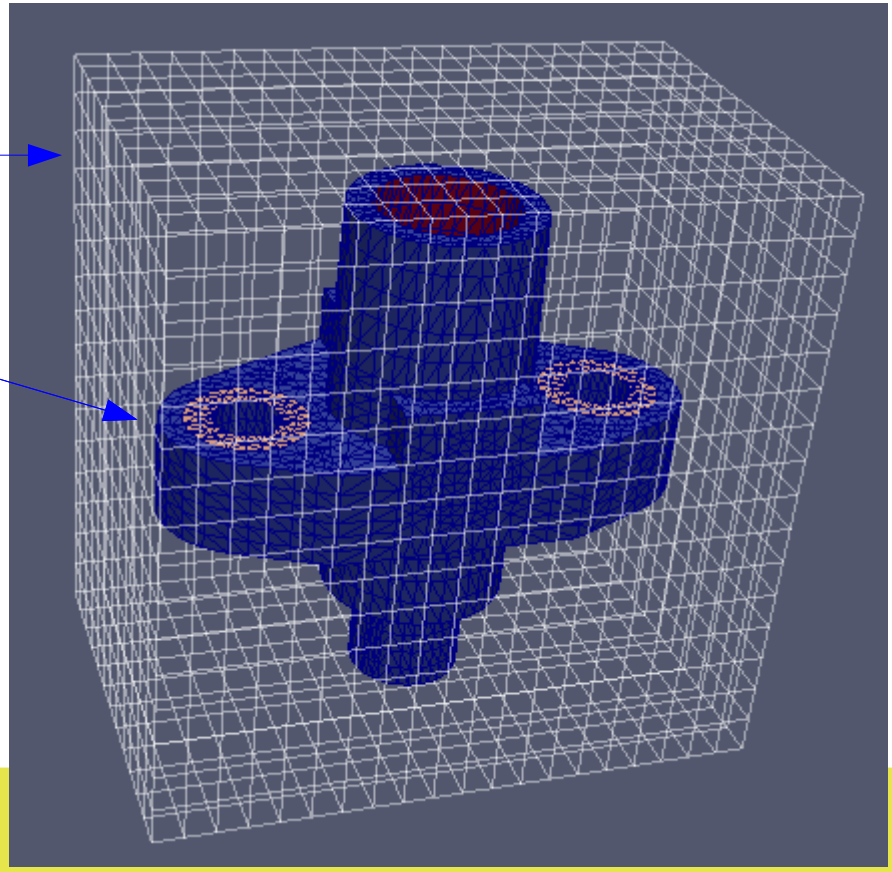
2011/6/26

http://www.openfoam.com/news/snappyHexMesh-feature-edge.php

チュートリアルケース
$FOAM_TUTORIALS/mesh/snappyHexMesh/flange



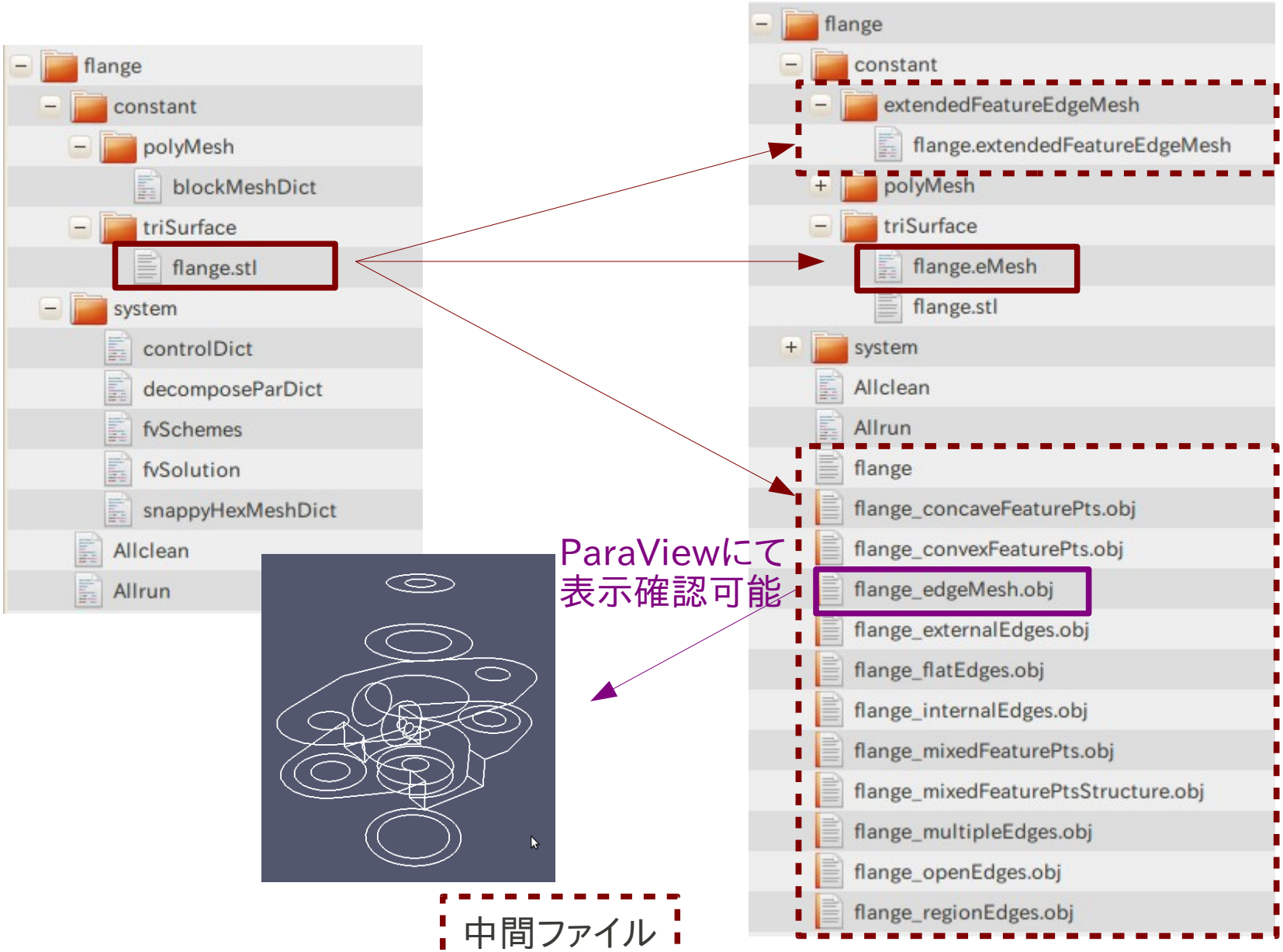
blockMesh



```
#!/bin/sh
# Source tutorial run functions
. $WM_PROJECT_DIR/bin/tools/RunFunctions

runApplication blockMesh
runApplication surfaceFeatureExtract -includedAngle 150 -writeObj constant/triSurface/flange.stl flange
runApplication snappyHexMesh -overwrite
```

surfaceFeatureExtract

surfaceFeatureExtract -includedAngle 150 -writeObj constant/triSurface/flange.stl flange



後の工程（snappyHexMesh）では使用しない

snappyHexDict

1.7.x ⇒ 2.0.x 変化点

```
castellatedMesh
snap
addLayers

geometry

castellatedMeshControls
    maxLocalCells
    maxGlobalCells
    minRefinementCells
    maxLoadUnbalance
    nCellsBetweenLevels
    features
    refinementSurfaces
    resolveFeatureAngle
    refinementRegions
    locationInMesh
    allowFreeStandingZoneFaces

snapControls
    nSmoothPatch
    tolerance
    nSolveIter
    nRelaxIter
    nFeatureSnapIter
```

Featureデータ（*.eMesh）を定義

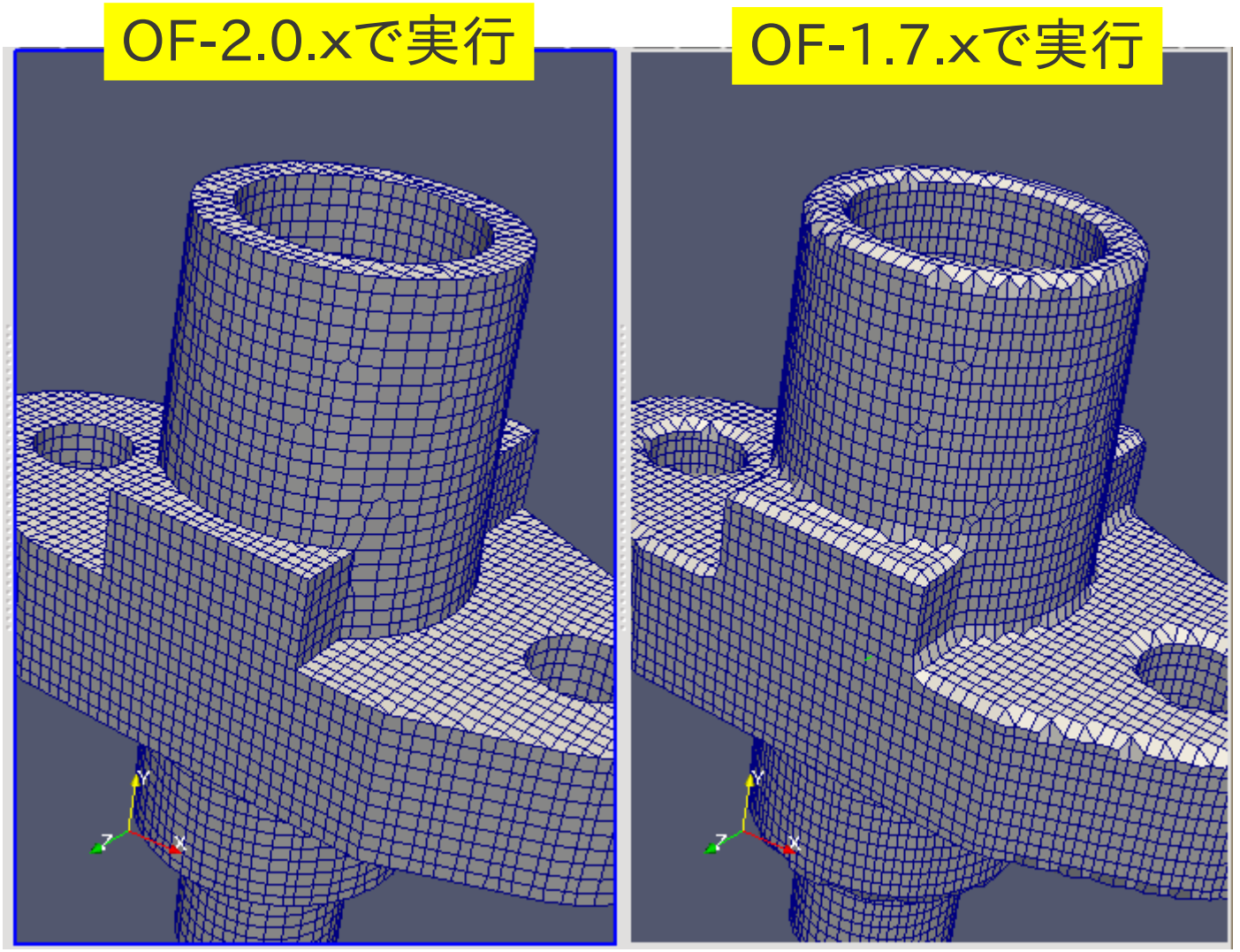
これがないと動作しない

これがないとFeatureSnappが機能しない

```
addLayersControls
    relativeSizes
    layers
    expansionRatio
    finalLayerThickness
    minThickness
    nGrow
    featureAngle
    nRelaxIter
    nSmoothSurfaceNormals
    nSmoothNormals
    nSmoothThickness
    maxFaceThicknessRatio
    maxThicknessToMedialRatio
    minMedianAxisAngle
    nBufferCellsNoExtrude
    nLayerIter
    nRelaxedIter

meshQualityControls
    maxNonOrtho
    maxBoundarySkewness
    maxInternalSkewness
    maxConcave

    minVol
    minTetQuality
    minArea
    minTwist
    minDeterminant
    minFaceWeight
    minVolRatio
    minTriangleTwist
    nSmoothScale
    errorReduction
    relaxed

debug
mergeTolerance
```

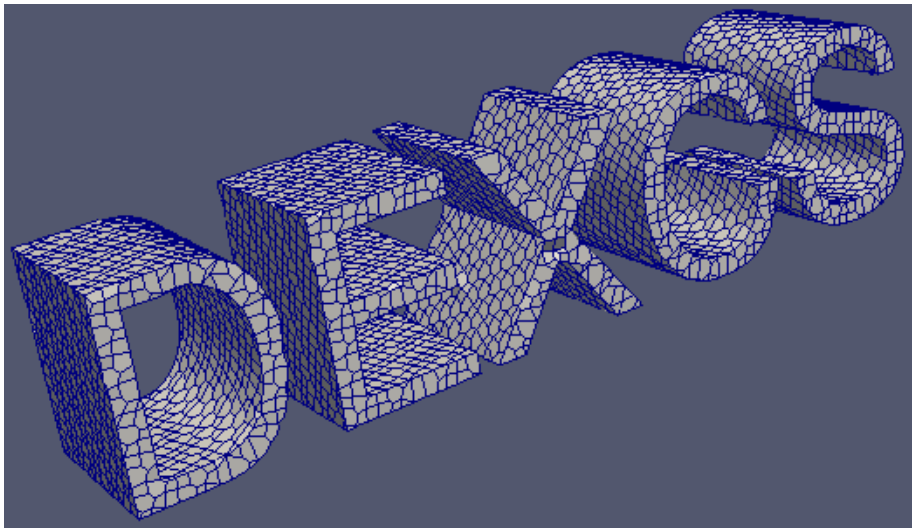
2.0.x 用の snappyHexDict は、OF-1.7.xでも動作可能

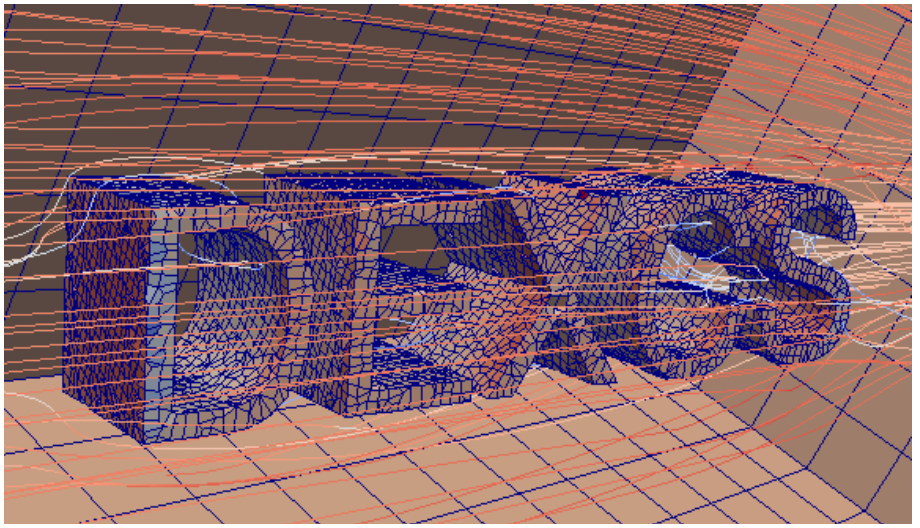
snappyHexMesh



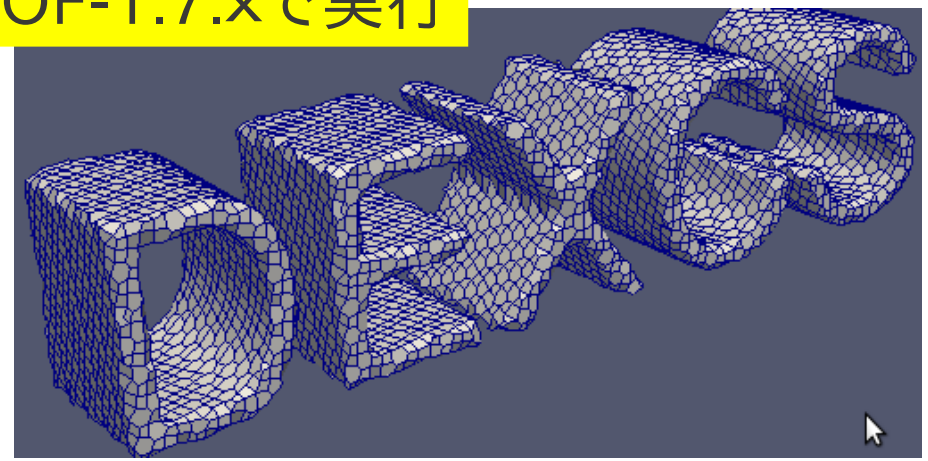
DEXCS for OpenFOAM(R) の標準モデルで作成

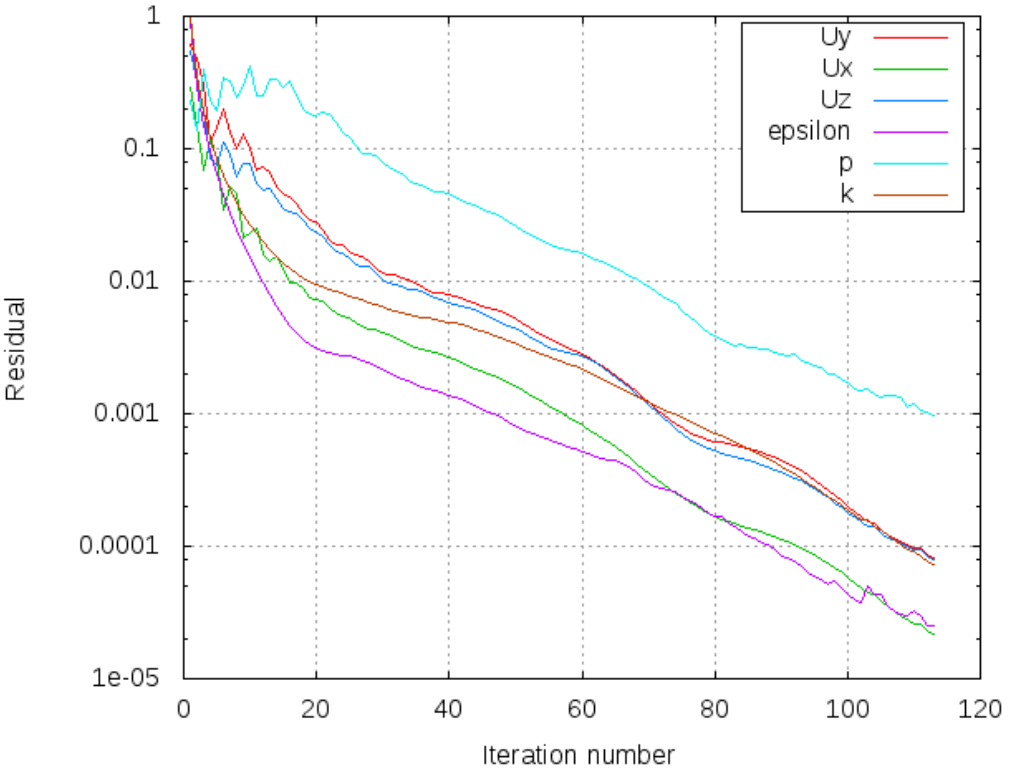
http://mogura7.zenno.info/~et/xoops/modules/wordpress/index.php?p=405

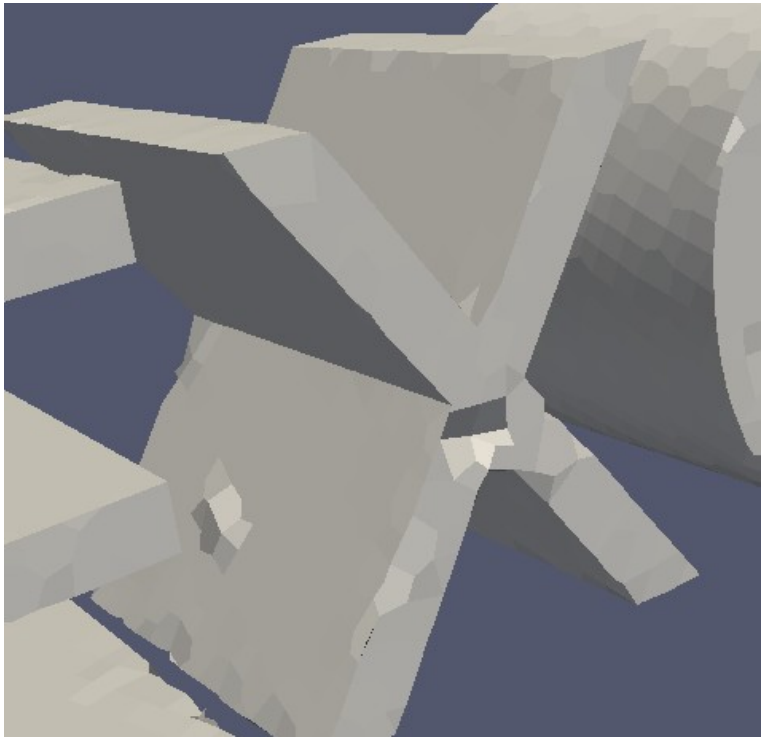


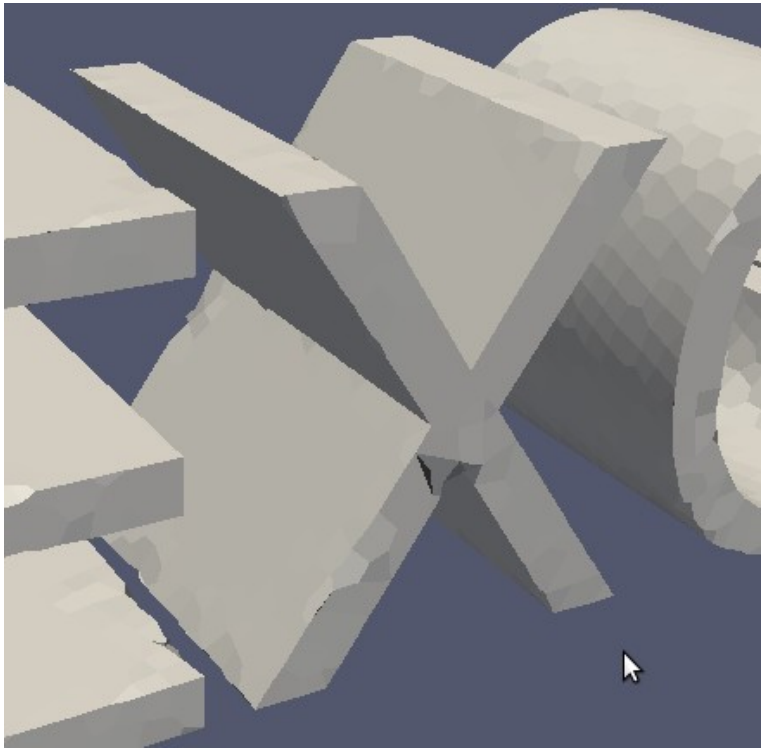


OF-1.7.xで実行

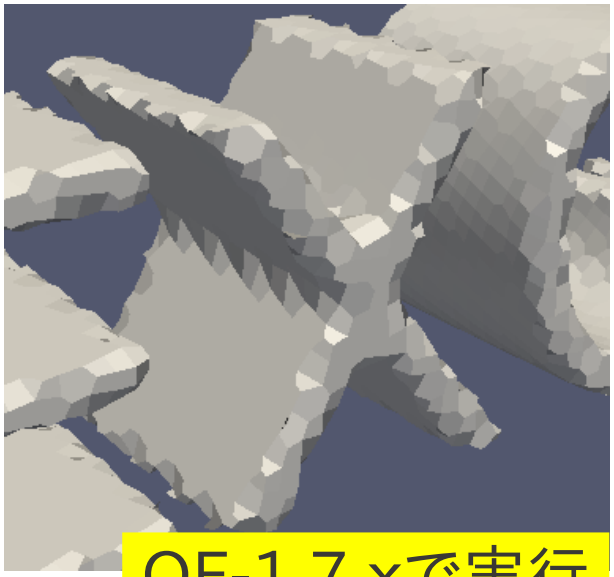




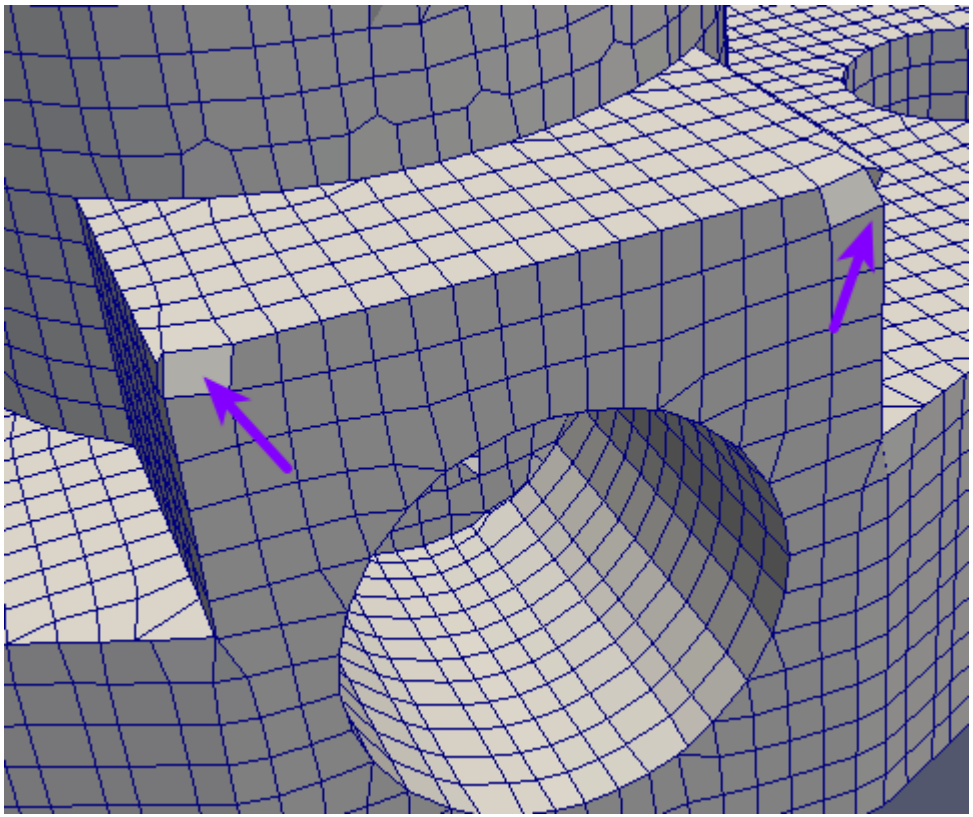
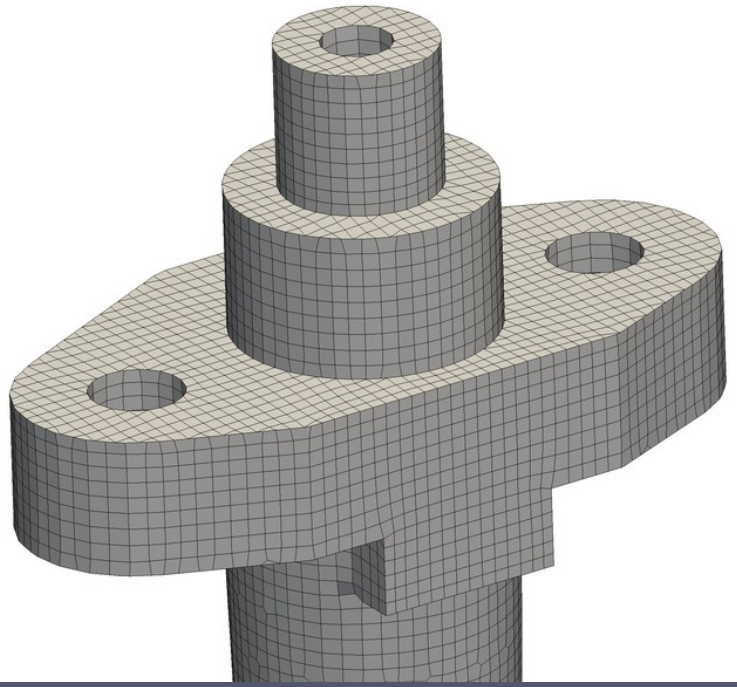
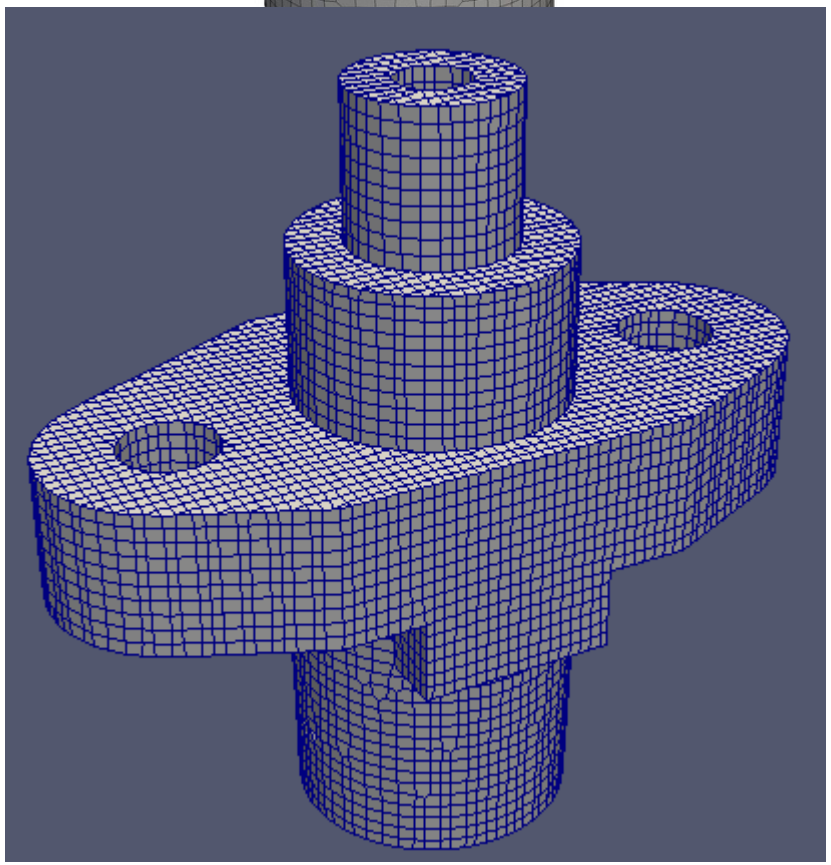




```
156 // Settings for the snapping.
157 snapControls
158 {
159     //- Number of patch smoothing iterations before finding correspondence
160     //  to surface
161     nSmoothPatch 3;
162
163     //- Relative distance for points to be attracted by surface feature point
164     //  or edge. True distance is this factor times local
165     //  maximum edge length.
166     tolerance 1.0;
167
168     //- Number of mesh displacement relaxation iterations.
169     nSolveIter 300;
170
171     //- Maximum number of snapping relaxation iterations. Should stop
172     //  before upon reaching a correct mesh.
173     nRelaxIter 5;
174
175     //- Highly experimental and wip: number of feature edge snapping
176     //  iterations. Leave out altogether to disable.
177     nFeatureSnapIter 10;
178 }
```



OpenFOAM in Windows using a VirtualBox virtual machine with Ubuntu guest OS
May 25th 2011

OpenFOAM on Amazon Elastic Cloud Compute
OpenCFD presents a quick start guide on running OpenFOAM on Amazon Elastic Cloud Compute (EC2).
May 6th 2011

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