

BAND-AID

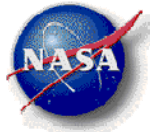
USERS Manual

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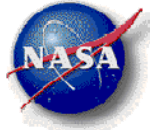
NASA Langley Research Center

Steps



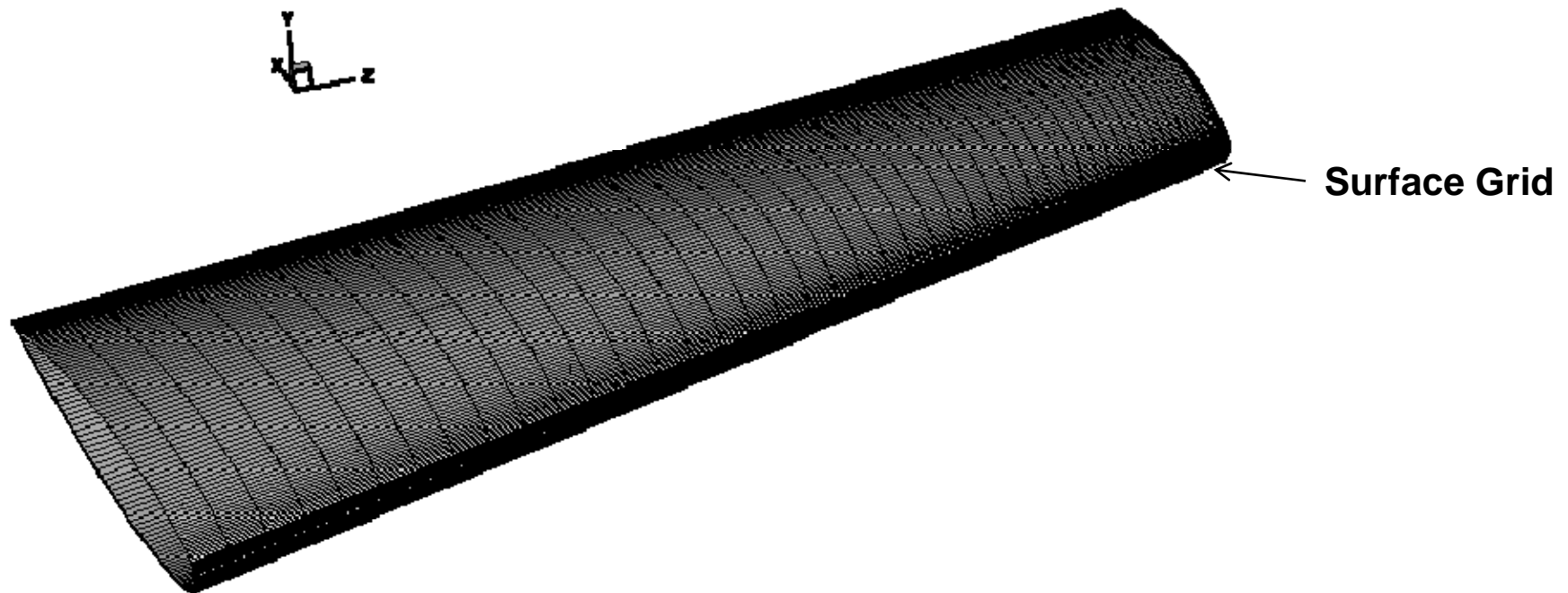
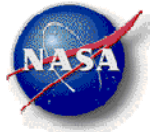
1. Compile
2. Example Grid and Marking Surface
3. Run
4. Deform Mesh
5. Visualize

Compile

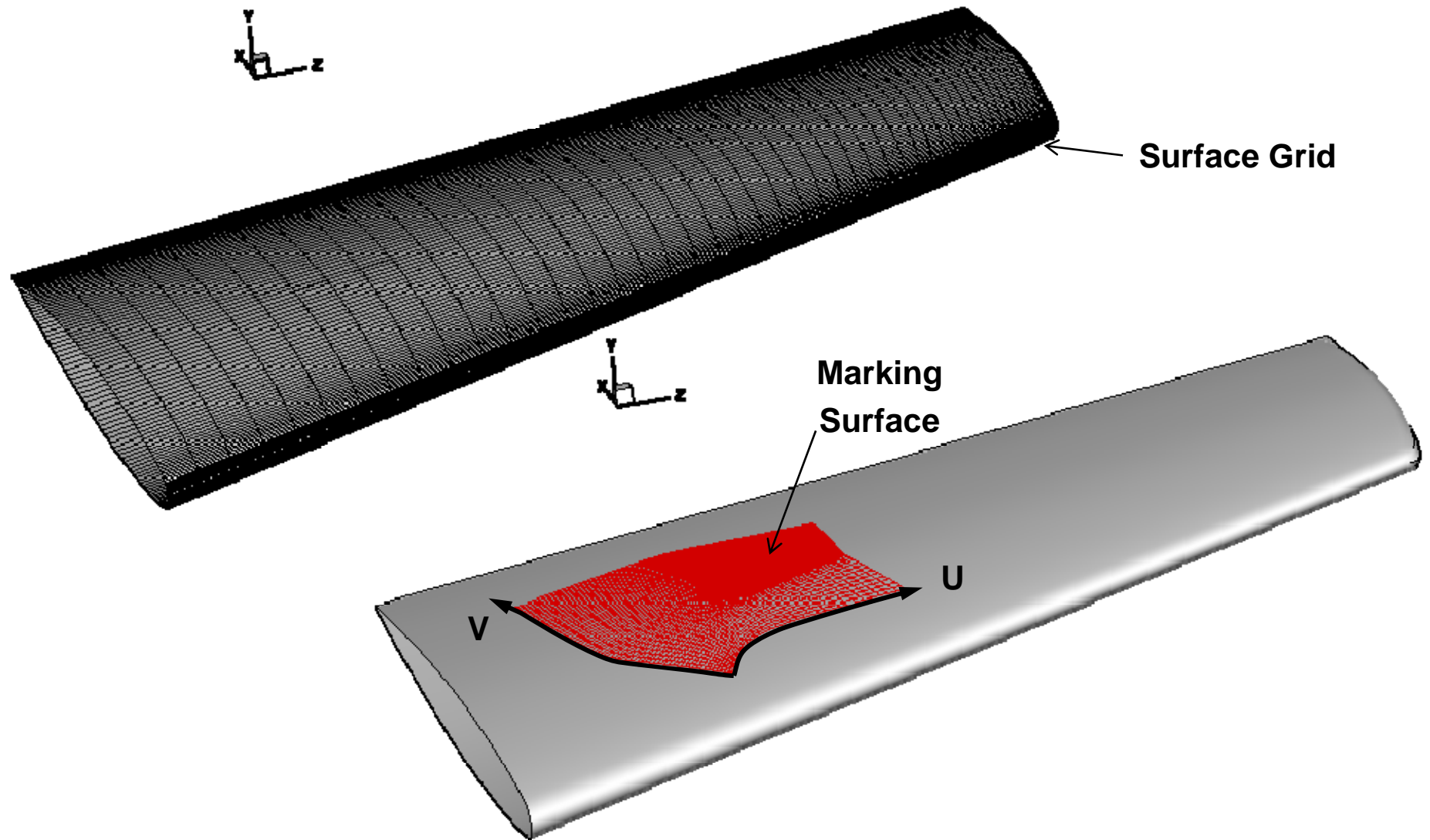
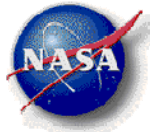


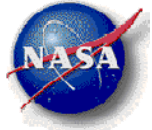
- Change file name, unzip, and make
 - mv ShapeDesign_BLSurfaceMay0808.piz
shapeDesign_BLSurfaceMay0808.zip
 - unzip ShapeDesign_BLSurfaceMay0808.zip
 - cd ShapeDesign_BLSurface
 - make
 - Copy “bandAids.exe” to your working directory
- Makefile uses “gcc” compiler. If you would like to use a different compiler, change Makefile accordingly

Examples (M6 Wing)

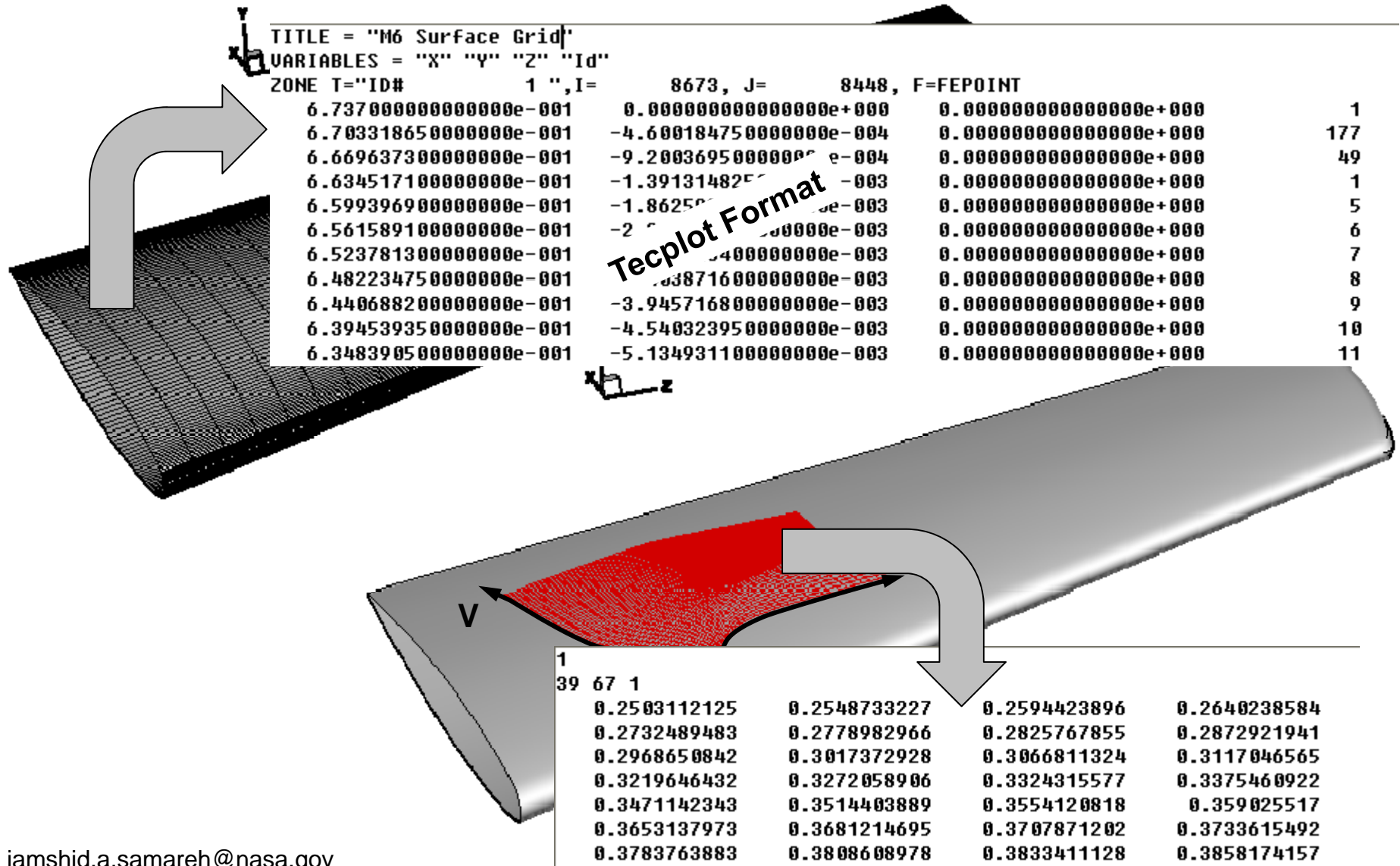


Examples (M6 Wing)

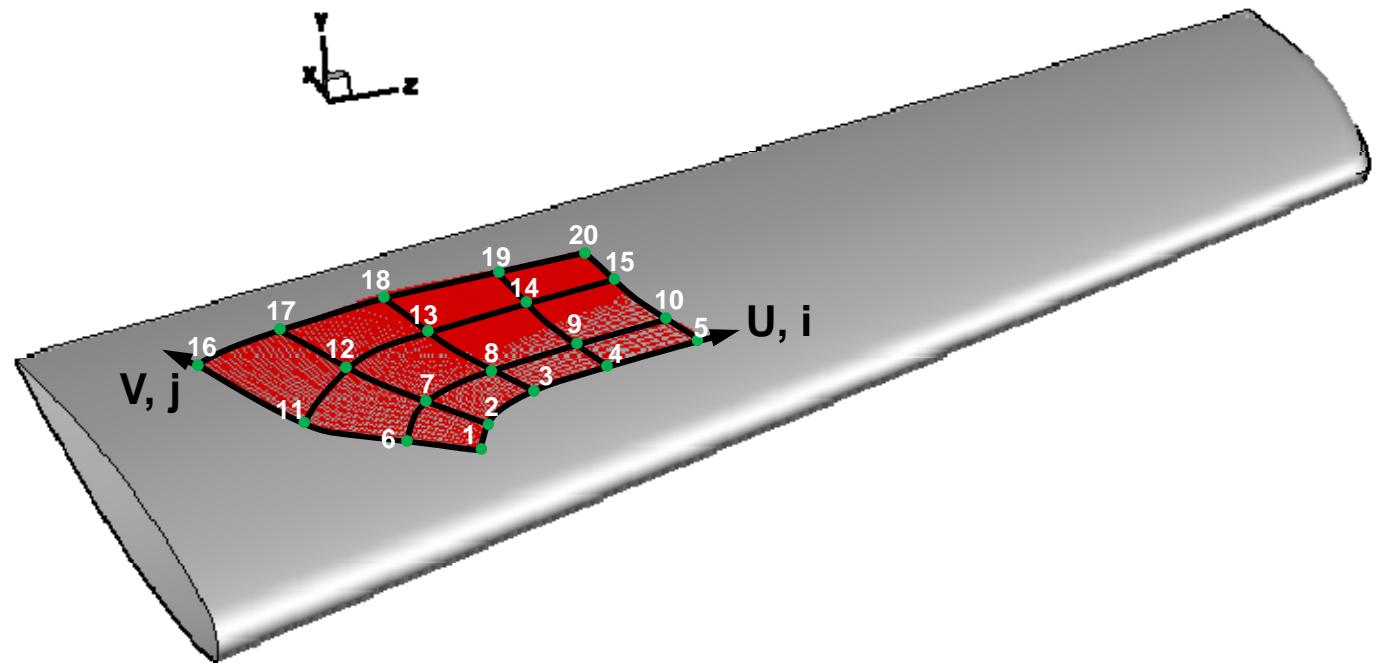
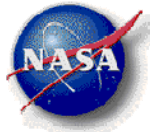




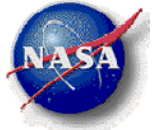
Examples (M6 Wing)



Examples (M6 Wing)



Run



- Command line:

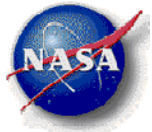
bandAids inGrid.plt inDesignSurf.p3d output numDesignInU numDesignInV [tol]

- inGrid.plt input grid in tecplot format
- inDesignSurf.p3d input marking surface in plot3d format
- outfile output file name prefix
- numDesignInU number of design variables in u-direction
- numDesignInV number of design variables in v-direction
- Tol optional, the max gap between grid and marking surface

- Example:

- bandAids M6.plt M6_DesignSurface.p3d M6 5 4 0.005

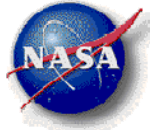
Run, Cont.



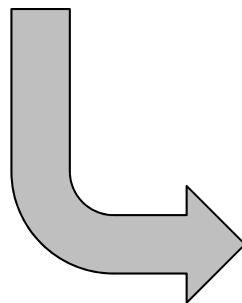
Run produces seven files:

- M6.bandaid, this file contains all non-zero shape information that can be read directly by FUN3D
- M6.distance.plt, this is a tecplot file containing surface grid including the distance between the surface grid and marking surface
- M6.distanceSD.plt, this is a tecplot file containing surface grid and sensitivity data
- bandAidsSample.dvs (template for input design variable file)
- bandAidsAll.usd, bandAidsCol.usd, and bandAidsRow.usd (used for linking design variables)

Deform

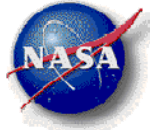


- Command:
 - bandAids -deformMesh M6.distanceSD.plt my.dvs newM6.plt
- newM6.plt is the deformed surface grid
- my.dvs contains values of design variables (see bandAidsSample.dvs)



```
## this is a user-defined design variabl
30
 1 0.0
 2 0.0
 3 0.0
 4 0.0
 5 0.0
 6 0.0
 7 0.0
 8 0.0
- - -
```

Visualize: Two approaches



- Use tecplot:
 - `tecplot M6.distanceSD.plt`
 - The tecplot file contains the derivatives of surface grid with respect to design variables (e.g., XD19, YD19, ZD19)
- Use GridTool
 - `GridTool -d M6.distanceSD.plt`