

Wednesday, May 2, 2012

spardesign\biplane-spar-constload\untwisted

### Procedure for setting up a new biplane spar configuration

- make a new configuration folder:  $\rightarrow$  XX-bispar-rjXXX-gXXX
- Open MATLAB script: spardesign\DYMORE\biplaneNURBS.m

$\rightarrow$  change USER-DEFINED PARAMETERS

- $\left\{ \begin{array}{l} g\_to\_c \\ jt\_end\_station \end{array} \right.$

$\rightarrow$  run the script ... this will write \*\_curve.dat and \*\_mesh.dat and \*.dgp files and shapes.dat to spardesign\DYMORE\input-files

$\rightarrow$  save the figure as: XX-bispar-rjXXX-gXXX.fig and XX-bispar-rjXXX-gXXX.png (in the new configuration folder)

- Open Python script: spardesign\writeDYMOREfiles.py

$\rightarrow$  change parameters for each spar region

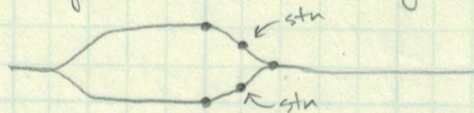
- STRAIGHT BIPLANE REGION, UPPER (CO)
- " " " LOWER (GH)
- JOINT TRANSITION REGION, UPPER (DE)
- " " " LOWER (HE)
- OUTBOARD MONOPLANE REGION (EF)

$\left\{ \begin{array}{l} spar\_stn\_list \\ biplane\_flag\_list \end{array} \right.$

$\rightarrow$  run the script ... this will write \*\_props.dat files to spardesign\DYMORE\input-files

- Open Excel file: spardesign\testmatrix.xlsx

$\rightarrow$  read "stn" under "curved beam parameters"  
this is the spar station that is in the middle of the joint transition region



if  $k_2$  is non-zero, you need to rerun the VABS input file for the cross-section at this spar station with the correct  $k_2$ -value

- Open a Windows command prompt

> cd "D:\data\2012-04-30 (biplane cross-sections with  $k_2$  curvature)"  
> copy spar\_station-XX.dat spar\_station-XX- $\underbrace{k_2}_{k_2 \times 1000}$ -XXXX.dat

skip  
 $k_2 = 0$   
for middle  
stn



- Open VABS input file: "D:\data\2012-04-30\...\spar\_station\_XX-k2-XXXX.dat"
  - change curve\_flag to 1 in line 3
  - add the curvatures  $k_1$   $k_2$   $k_3$  on line 4
 

$k_1$	$k_2$	$k_3$
↑	↑	↑
0.0	0.0000	0.0
- Open a Windows command prompt
  - > cd %spardesign%
  - > .\VABS\VABSIII "D:\data\2012-04-30\...\spar\_station\_XX-k2-XXXX.dat"
- Open VABS output file: "D:\data\2012-04-30\...\spar\_station\_XX-k2-XXXX.dat.K"
  - check that all diagonal entries in the Timoshenko stiffness matrix are positive
  - copy output file to spardesign\VABS\cs-database\biplane\_curved\
- Open Python script: spardesign\DYMORE\makeSingleMKblock.py
  - change parameters
    - { spar\_station
    - dymoreMKfile
    - vabsMK
  - run the script
  - copy the <dymoreMKfile> to the new configuration folder
    - open the <dymoreMKfile> and edit the @ETA\_COORDINATE to match "eta" in the "curved beam parameters" in testmatrix.xlsx
- Open Windows Explorer: spardesign\DYMORE\input\_files
  - copy all the files in this folder to the new configuration folder:
    - spardesign\biplane-spar-constload\untwisted\XX-bispar\rjXXX-gXXX
- Open Windows Explorer: <new configuration folder>
  - double-click openinputs\_props.bat
    - ↑ this will open gVim
    - ↑ in the files { DE-jointTrans-upper\_props.dat
    - { HE-jointTrans-lower\_props.dat
  - edit the beam properties of the middle spar station to match the contents of <dymoreMKfile> (copy and paste)
  - save all
  - double-click run dymore.bat

skip  
it  
if  
 $k_2=0$   
for  
middle  
stn