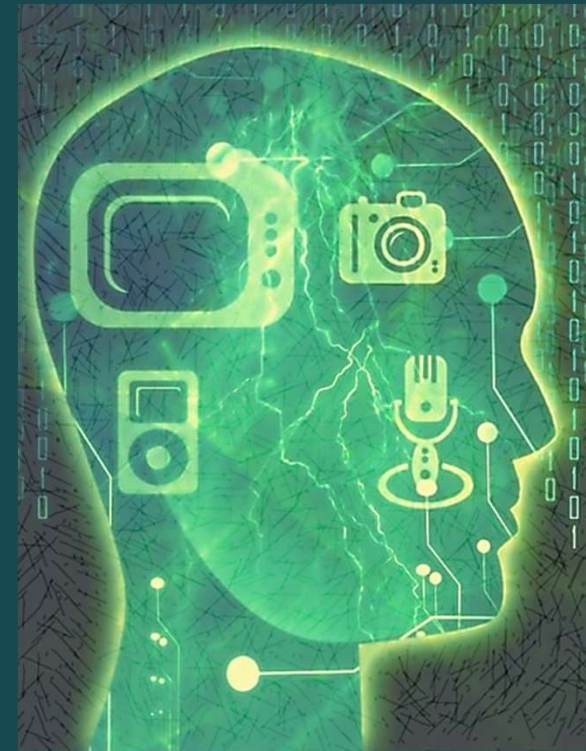


IPS User Summit

Spring 2024



flex
structures



Sandalwood
Engineering & Ergonomics
Work Smarter. Work Safer.

AGENDA

- **Welcome**
 - Karl Bangert, fleXstructures North America
 - Mike Vitek, Sandalwood Engineering
- **Q&A Review from Fall Meeting**
 - John Lewkowicz, Sandalwood Engineering
- **Upcoming sessions**
 - Summer Release Session (Virtual)
 - Fall North American User Summit

Research Items

These are items that do NOT have work in progress. They are ideas we brought forward, but are still on the “wish list” or there is preliminary research being done.

1. Internal contact handling between flexibles and bellows/grommets
2. Grommet installation - Visualize grommet installation and seating inside a fixed cut-out
3. 1-click solution for Kinematic motion export from Dassault 3DExperience

Work in Progress Items

These are items that are now on the “work” list with IPS.

There is not a solution at this time, but there is work being done.



Catia V6 Motion Export.pdf



Catia V6 Motion Import.lua

Question #1:

How to export Motion data from Dassault 3DEXPERIENCE / Catia V6 into IPS?

Background:

In Catia V5, this was a one-button operation. But not in V6.

Answer:

A workaround for 3DEXPERIENCE / Catia V6 exists.

- In 3DX, users must create the kinematic model, and create measures/probes to export motion to a CSV file.
- In IPS, a LUA script reads the CSV file and matches rigid bodies to motions.
- We are planning to improve the documentation to include step-by-step instructions
- We are seeking customer support to improve existing documentation

Work in Progress Items

These are items that are now on the “work” list with IPS.

There is not a solution at this time, but there is work being done.

POLL: Raise your hand if you're interested in refresher or single-user training

Question #2:

Can we have more detailed instructions for IPS (in training modules, for example).

Answer:

- Best practice sessions are available on IPS Showroom, These materials are included with your license. Requires a simple registration to access.
- Current Best Practice Sessions include:
 - Cable Analysis
 - Bellows and Grommets
 - Virtual Reality
 - Automation and LUA Programming
 - Subsegment Functions
 - Defining Material Properties
- Organization specific training is often most successful
 - Customer models as part of Starter Package training
- Sandalwood can provide standard or customized training to meet any customer need

Work in Progress Items

These are items that are now on the “work” list with IPS.

There is not a solution at this time, but there is work being done.

Question #3:

Can we have access to more material properties for flexibles?

Background:

IPS Cable simulation currently has a small but growing library of flexibles.

Answer:

- Best approach is to test and collect the data via MeSomics measurements
 - Important to calculate accurate forces
- Use the predefined library of cables/hoses as starting point for studies
- Bundle Properties Estimator
- Users can develop their own HMD databases
- Use tolerance envelopes to investigate sensitivity to material properties

Work in Progress Items

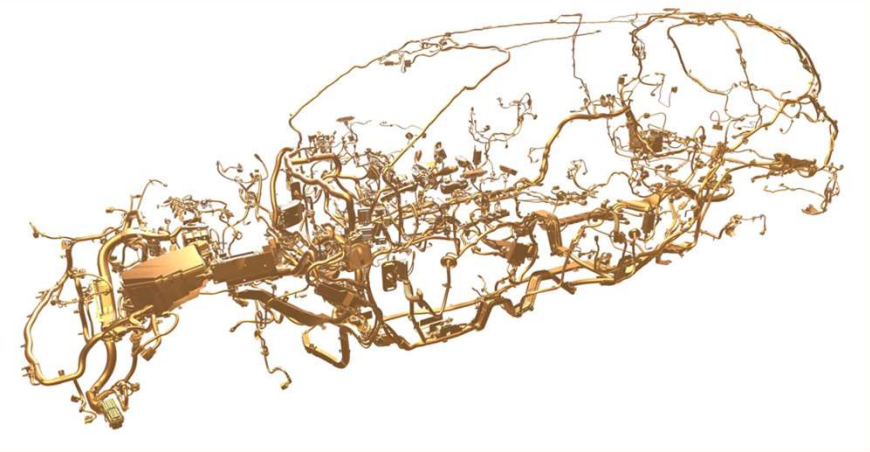
These are items that are now on the “work” list with IPS.

There is not a solution at this time, but there is work being done.

Question #4: Can we improve IPS Computation times?

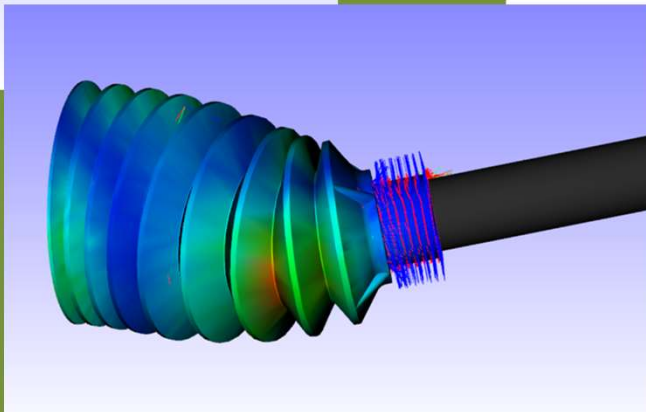
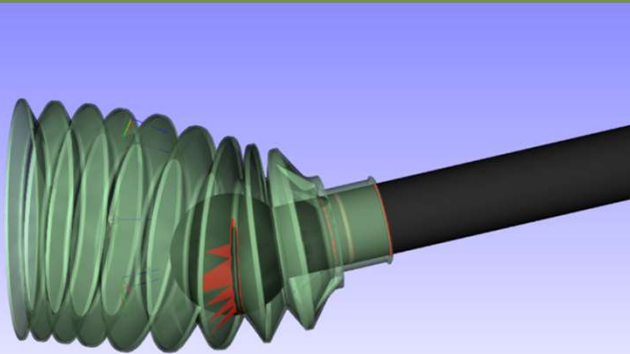
Answer:

- This is internal and ongoing research and development with timing TBD



Solution Items

These are items that have a solution, and we'll be walking through the process.



Question #1:

All Things Bellows & Grommets

A. More value measure and color map options for Bellows and Grommets

- Existing color map/value measure options include: displacement, von Mises stress, Equivalent strain, Contact pressure, and relative displacement
- Can also measure reaction forces and moments on the boundary conditions

B. Contact handling for bellows & grommets

- External contact with flexibles currently available
Eternal AND internal contact with rigid bodies currently available

Solution Items

These are items that have a solution, and we'll be walking through the process.



Question #2:

Customers want access to more import/export formats

Answer:

New since last NA User Summit

- Creo motion import - will send with deck after session

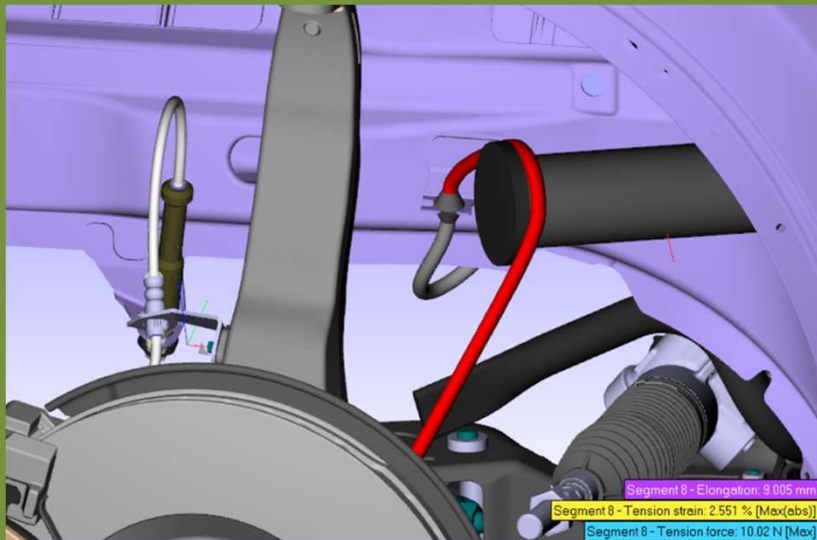
Included in June 2024 Release

- Import/Export STEP
- Import/Export JT 9.5-10.7

- Import/Export Catia V5 and Catia V6/3DXML
- Import Creo PVS and Creo native
- Import/Export NX native
- Kinematics Editor

Solution Items

These are items that have a solution, and we'll be walking through the process.



Question #3:

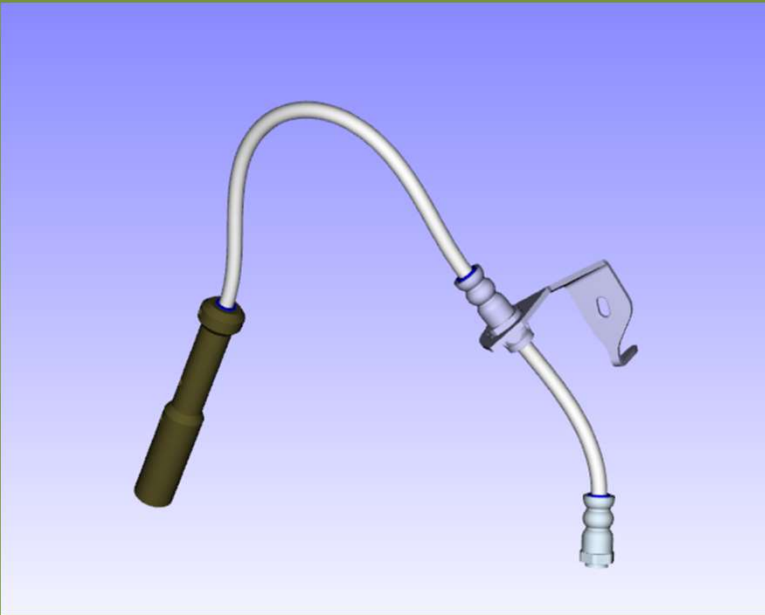
Is there a method to determine if a flexible can “wrap around” another component, and then unwrap/self-relieve?

Answer:

- This is possible using standard IPS modeling techniques
- Activate contact handling for all relevant flexibles and rigid bodies
- Track key value measures such as elongation, deformed length, tension force, tension strain, etc.
- Analyze and observe behavior

Solution Items

These are items that have a solution, and we'll be walking through the process.

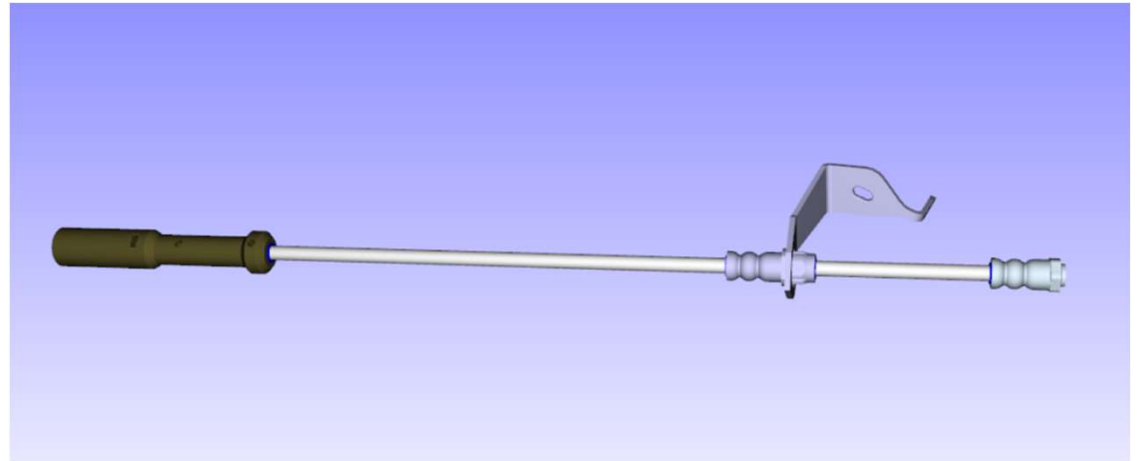


Question #4:

Is there a method to straighten flexibles from installed position, while maintaining fitting/bracket orientation?

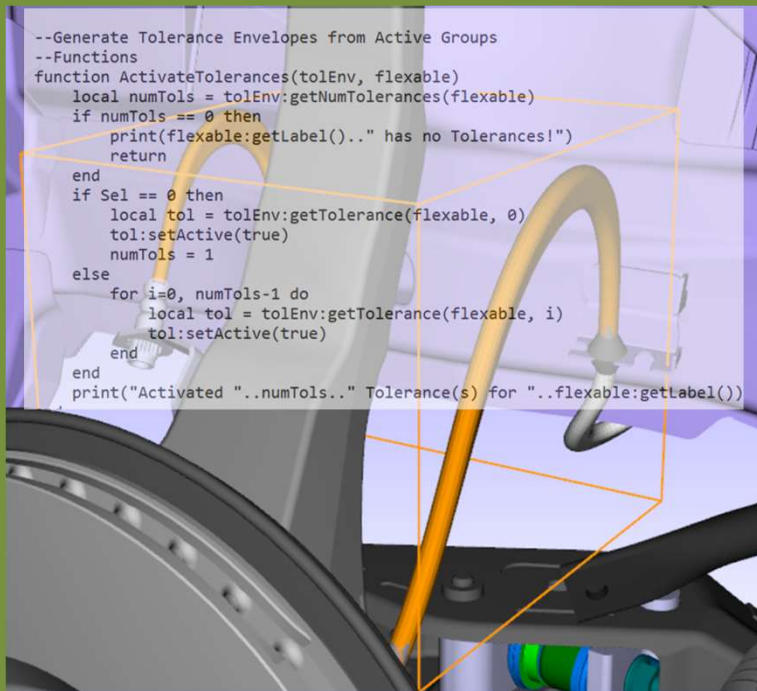
Answer:

- Existing method to “straighten” flexibles from the installed position
- Disable gravity, place geometries under a common node, and set from “fixed” to “free”



Solution Items

These are items that have a solution, and we'll be walking through the process.



Question #5: Can we automate common IPS tasks?

Answer:

- Yes, you can do this using Lua scripts
- What is possible to automate depends on the commands available in the Lua API. Wide variety of tasks and commands, more added frequently.
- Best practice session on Lua programming is available - IPS Showroom.
- Sandalwood can develop additional custom Lua scripts to meet customer needs

Upcoming IPS User Sessions

**Please look out for
our follow-up
survey!**

Summer User Session – June 14th

Online

Purpose: Share IPS updates, New features

**3rd Automotive Wire Harness Conf – 28-29 Oct
Dearborn**

Fall IPS User Summit – October 30th

In person – Michigan

Online Available

**Purpose: Meet other IPS users, Talk directly with IPS/
Sandalwood experts**

Thank you!