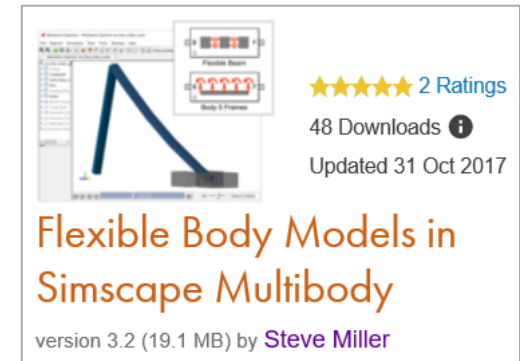
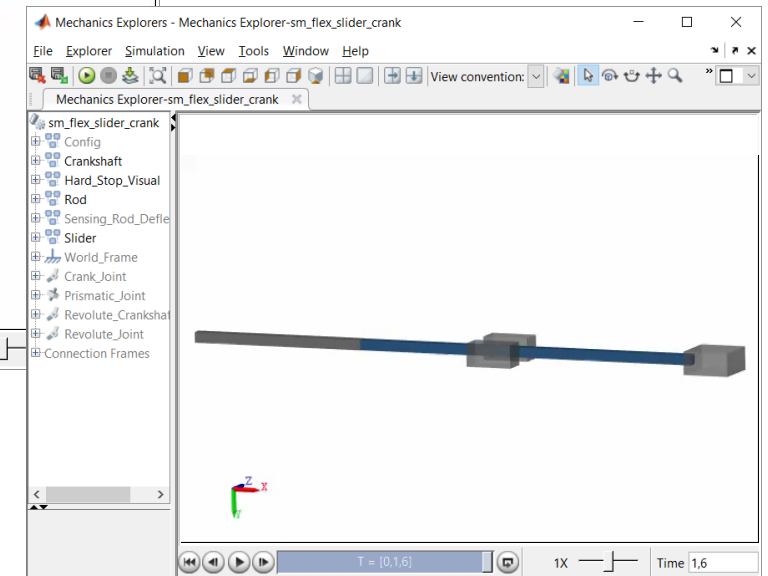
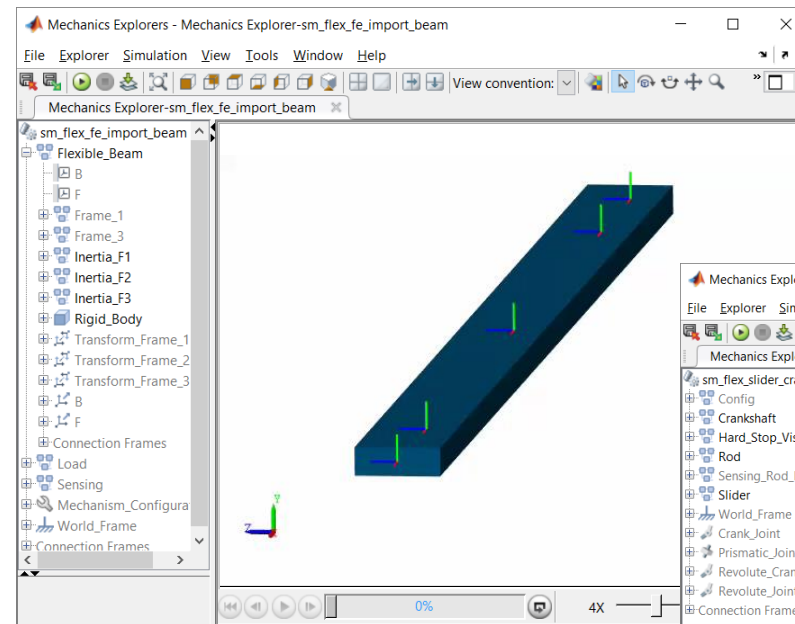
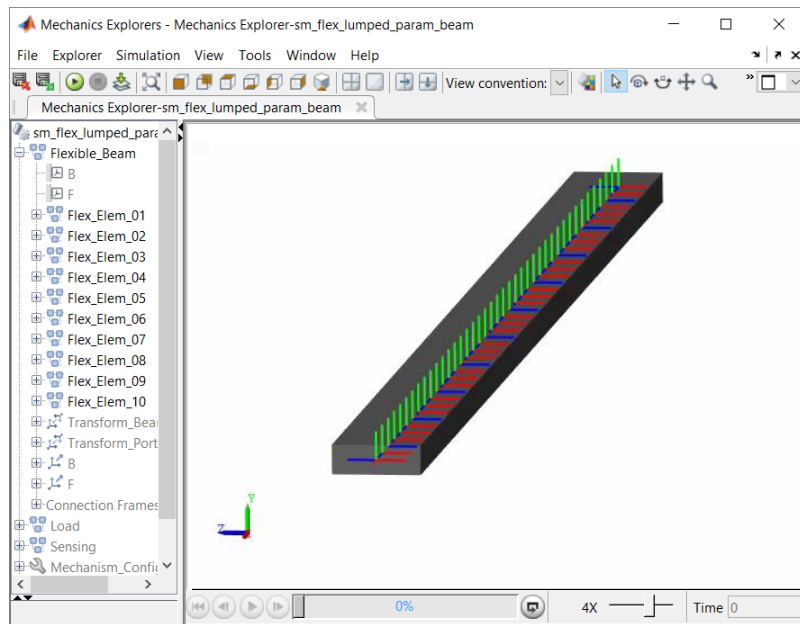


Flexible Body Examples on File Exchange

- Lumped parameter beam
 - Chain of mass-spring-dampers
- Finite element import beam
 - Superimpose bending onto rigid body motion

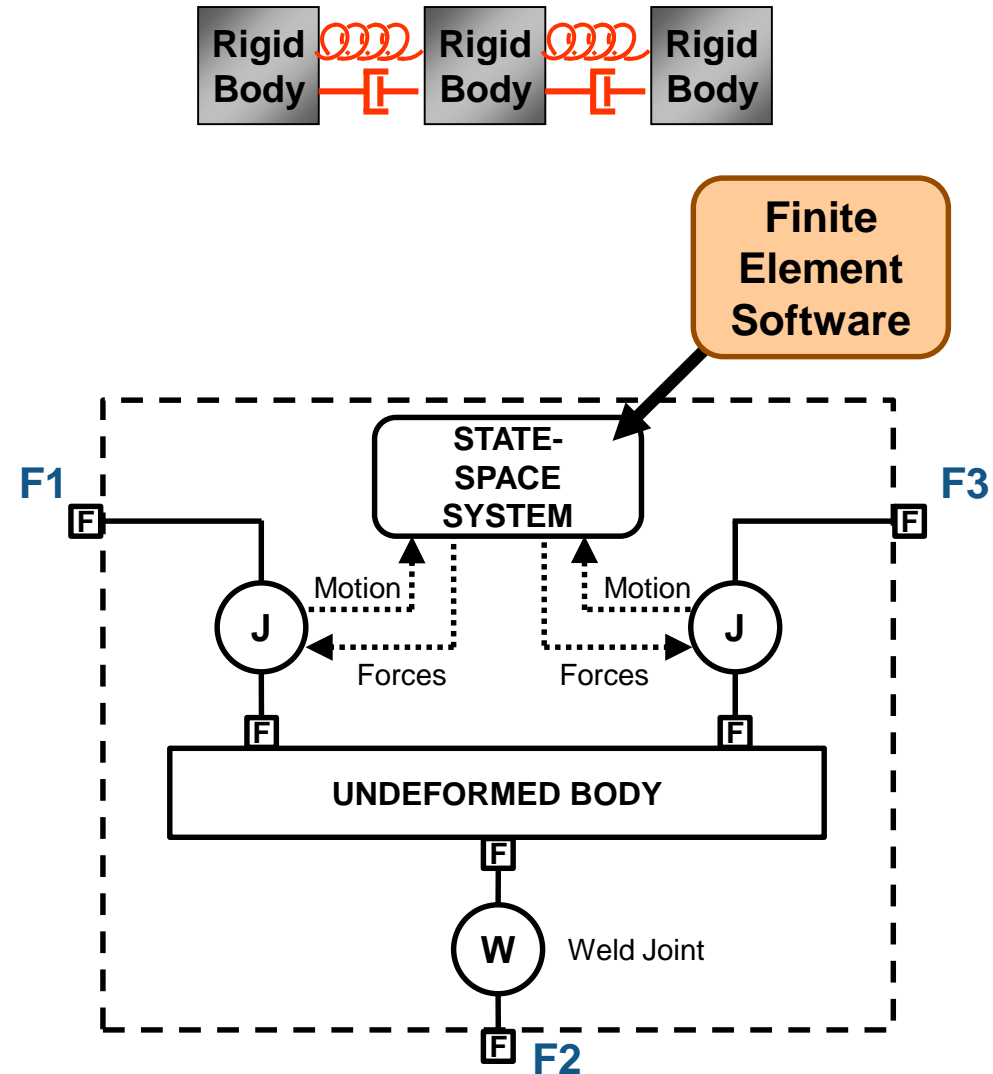


fileexchange/47051-flexible-body...

Flexible Bodies in Simscape Multibody

Approaches

- Lumped parameter approach
 - Chain of rigid body-spring-dampers
 - No finite element software required
 - Only for simple geometries
 - Stiffness value calculation
- FEA Approach
 - Export mass and stiffness matrices from FE software
 - Superimpose deflection onto rigid body motion
 - Valid for small deflections



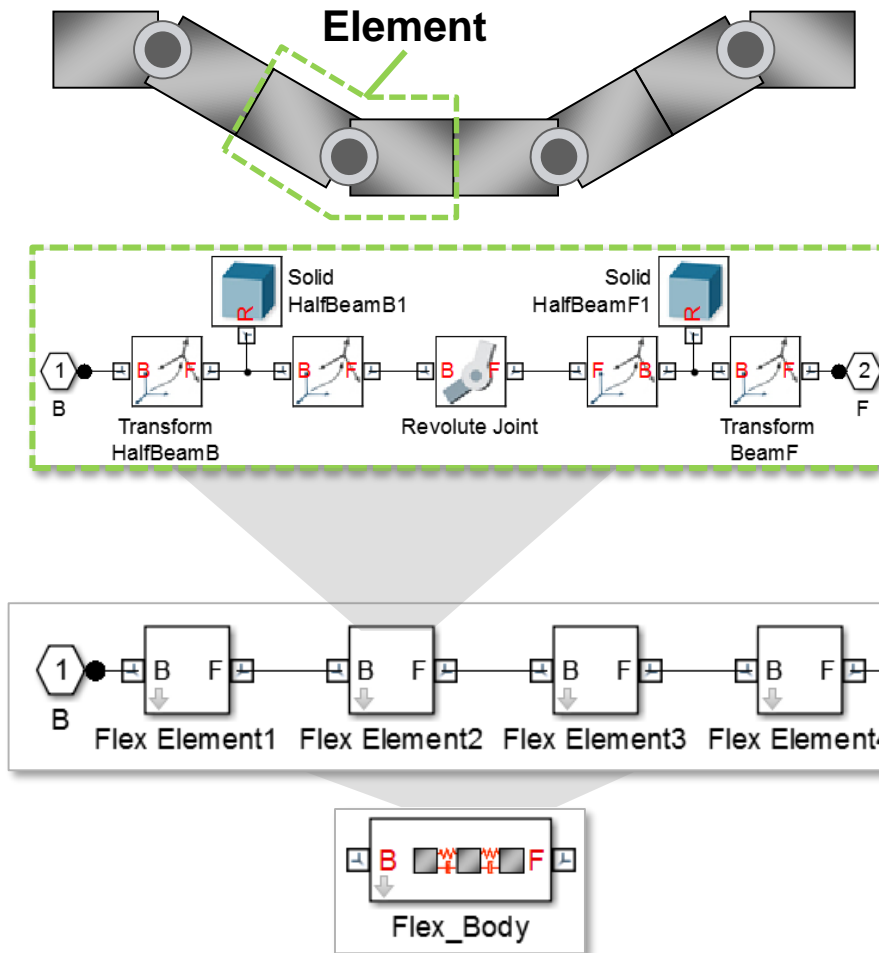
Lumped Parameter Approach

Generalized Flexible Element

- Joint primitives reflect flexible degrees of freedom
 - Bend: 1 rotational
 - Bend+twist: 2 rotational
 - Bend+stretch: 1 rotational + 1 prismatic

- Use MATLAB to automate construction of flexible body

```
for i = 2:1:numelem
    add_block('FlexBeam
    add_line(thisblock,
    add_line(thisblock,
```



Flexible Body Modeling Workflow

1. Create FE model in FEA software
2. Define part interface
3. Extract reduced order model
4. Import data into Simscape Multibody
5. Connect joints, forces, etc.
6. Simulate

