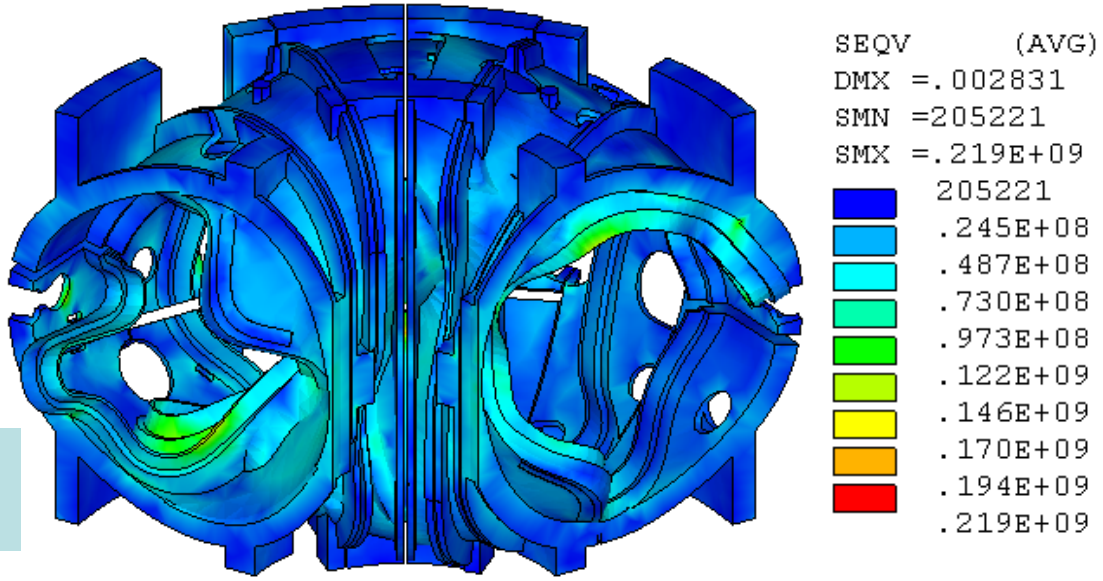
Effects of Young Modulus E on the Stress and Displacement for the Load Case of Dead Load Plus EM Load

- All runs have wing bag E equal to 2,908 MPa
- Three (3) runs were carried out:
  - A) Flange shim E = 150,000 MPa and Shell E = 145,000 MPa
  - B) Flange shim E = 75,000 MPa and Shell E = 145,000 MPa
  - C) Flange shim E = 75,000 MPa and Shell E = 100,000 MPa

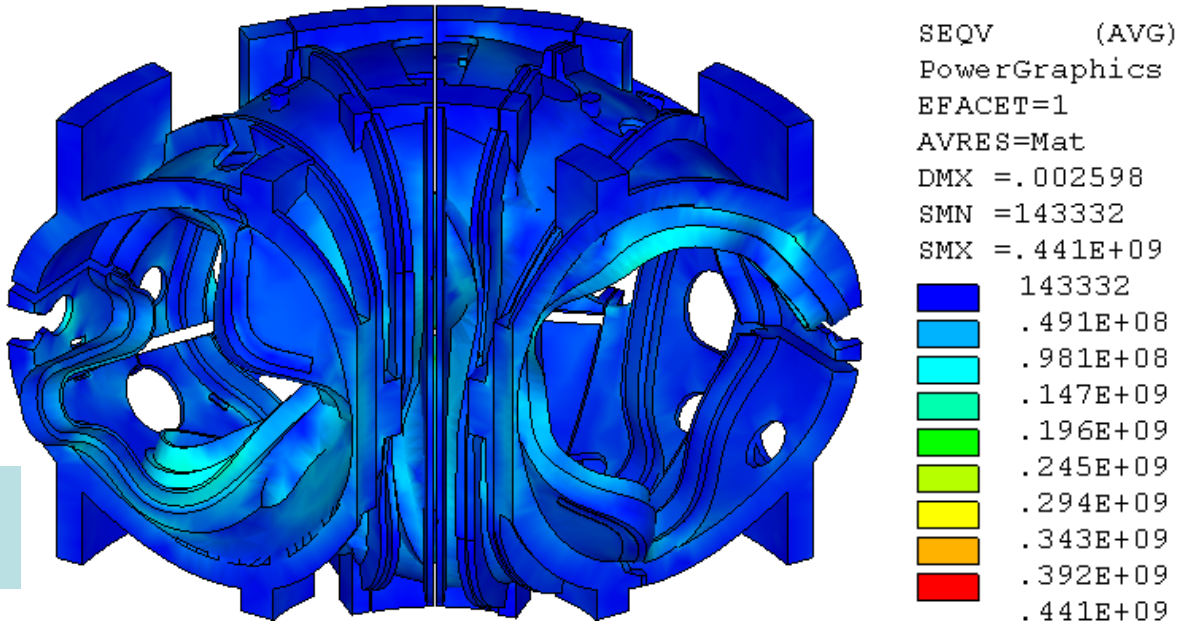
Modular Coil Winding Form Stress

- Dead Load + EM Load
- Wing Bags E = 2,908 MPa
- Flange shim E = 150,000 MPa
- Shell E = 145,000 MPa

Full graphics option

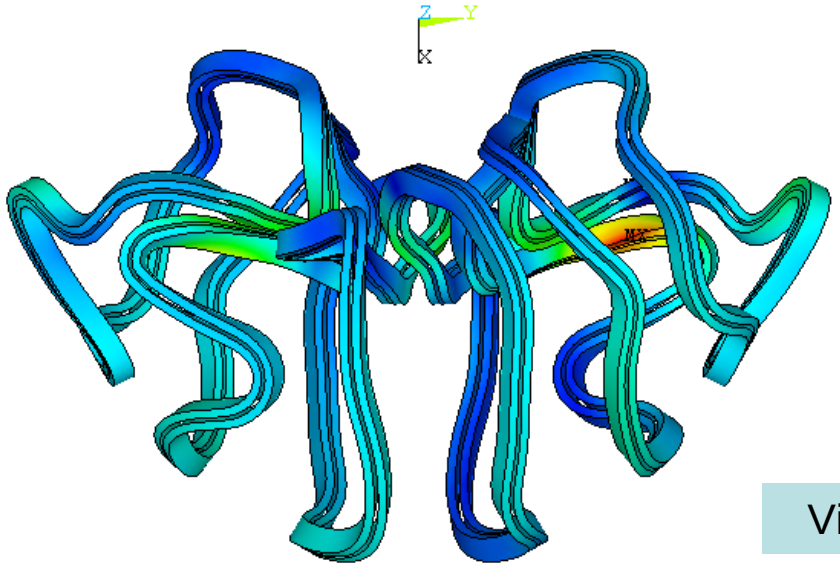


PowerGraphics option

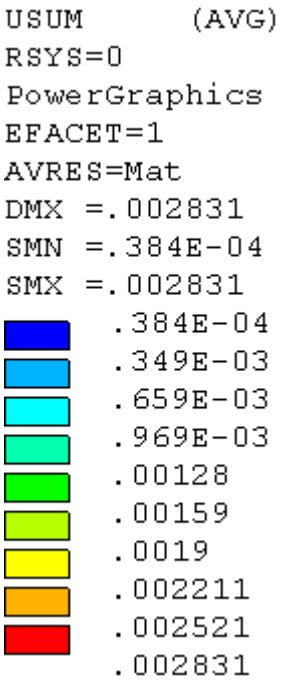


Modular Coil Displacements

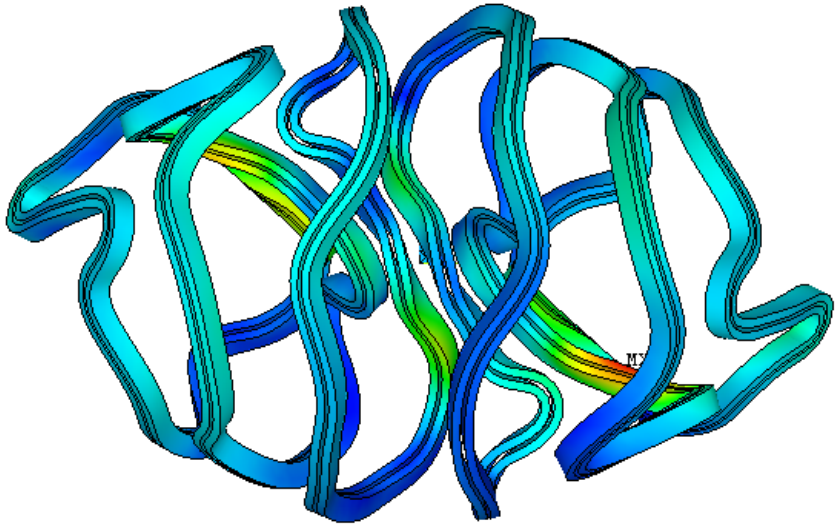
- Dead Load + EM Load
- Wing Bags E = 2,908 MPa
- Flange shim E = 150,000 MPa
- Shell E = 145,000 MPa



View from top



Unit in meter

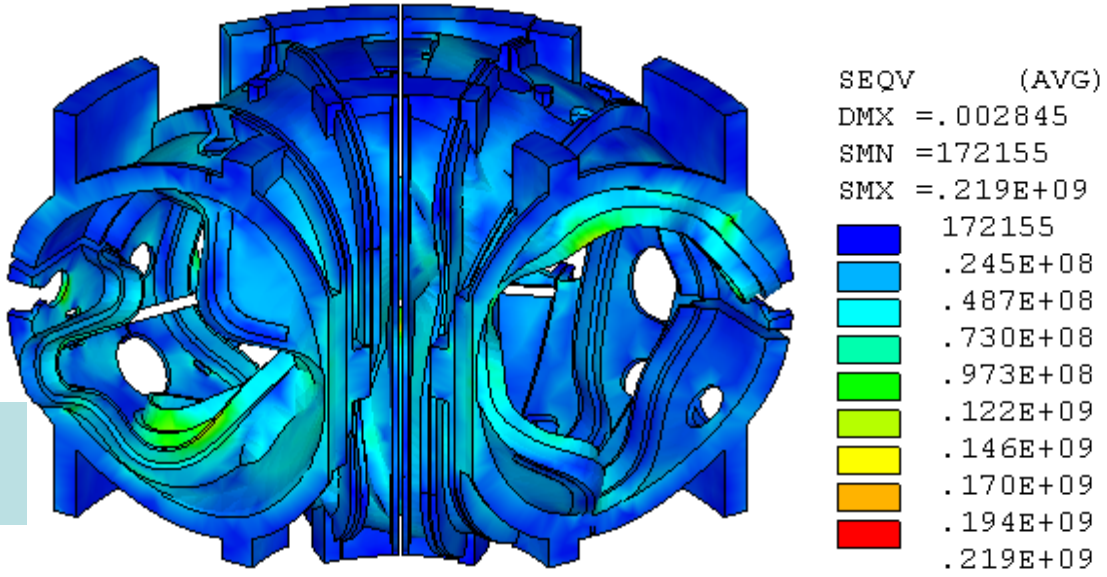


View from outboard side

Modular Coil Winding Form Stress

- Dead Load + EM Load
- Wing Bags E = 2,908 MPa
- Flange shim E = 75,000 MPa
- Shell E = 145,000 MPa

Full graphics option



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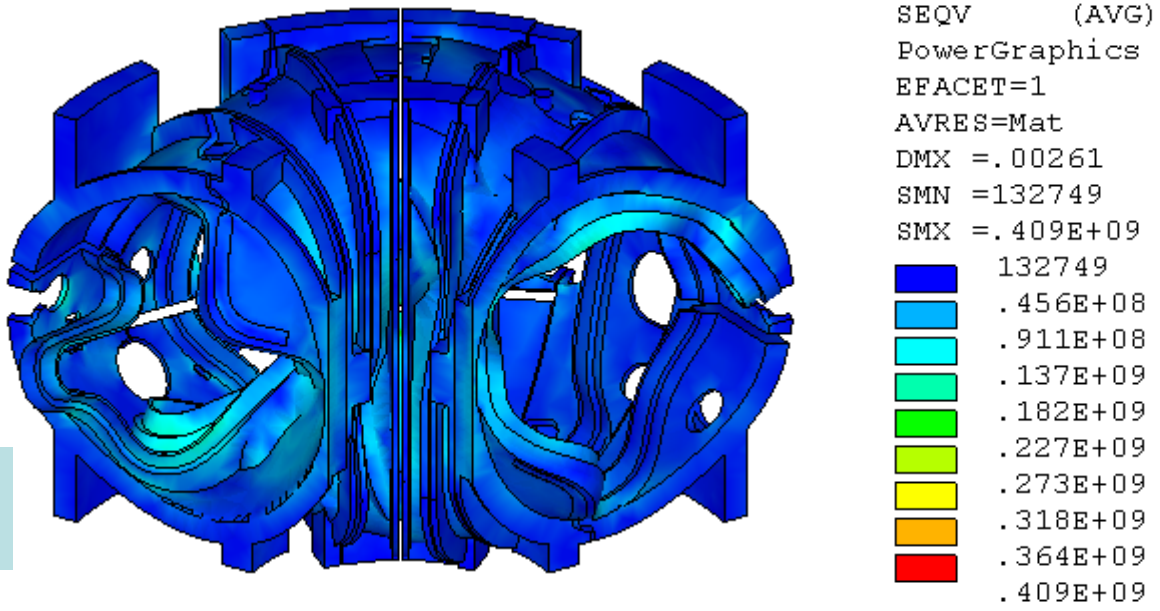
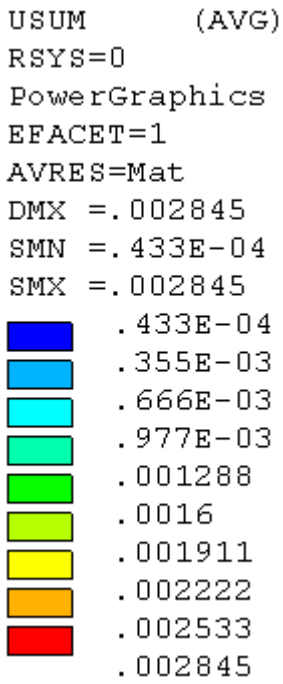
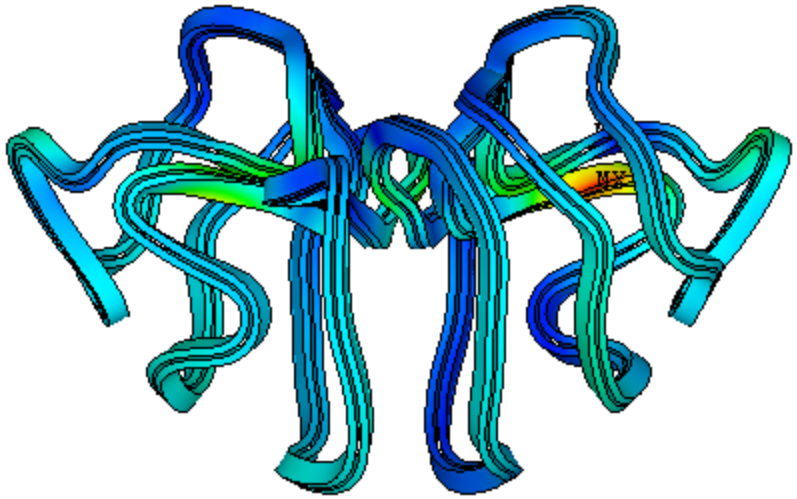


Modular Coil Displacements

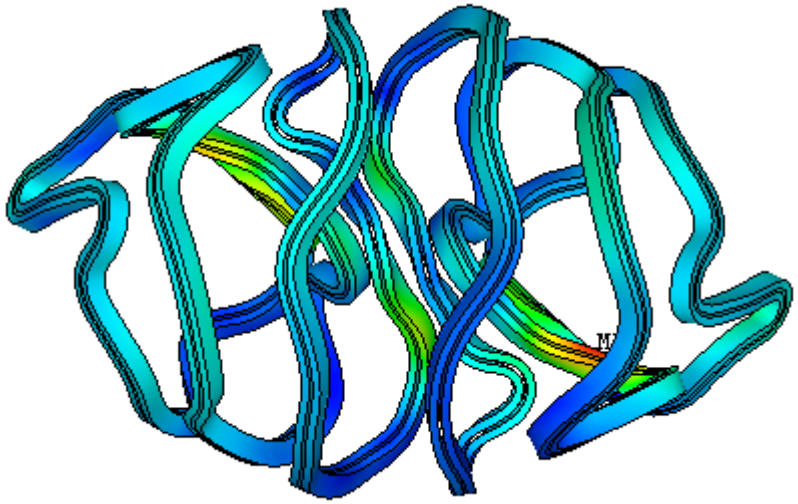
- Dead Load + EM Load
- Wing Bags E = 2,908 MPa
- Flange shim E = 75,000 MPa
- Shell E = 145,000 MPa



Unit in meter



View from top

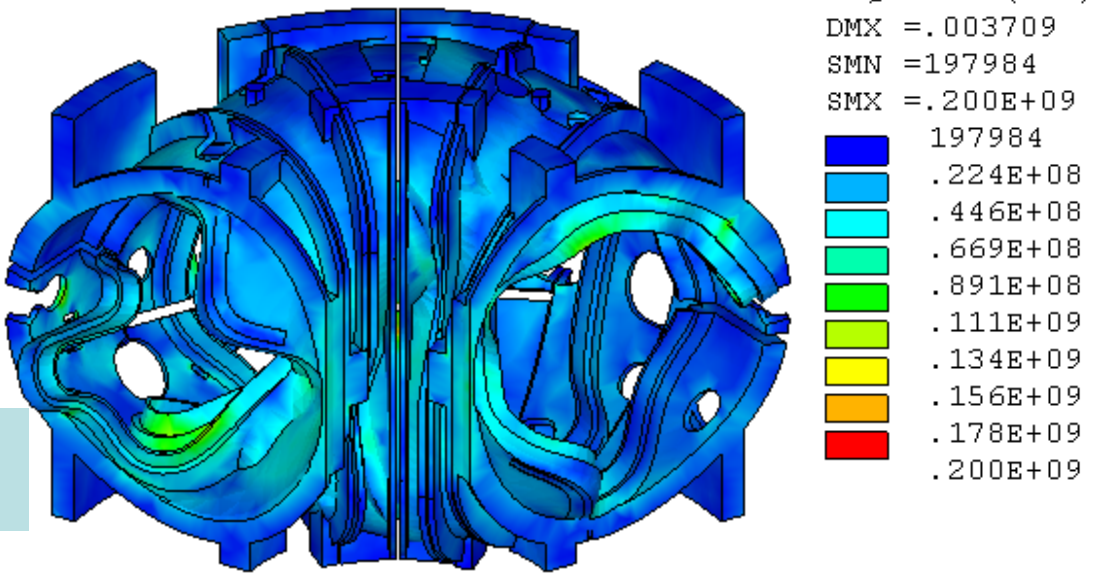


View from outboard side

Modular Coil Winding Form Stress

- Dead Load + EM Load
- Wing Bags E = 2,908 MPa
- Flange shim E = 75,000 MPa
- Shell E = 100,000 MPa

Full graphics option



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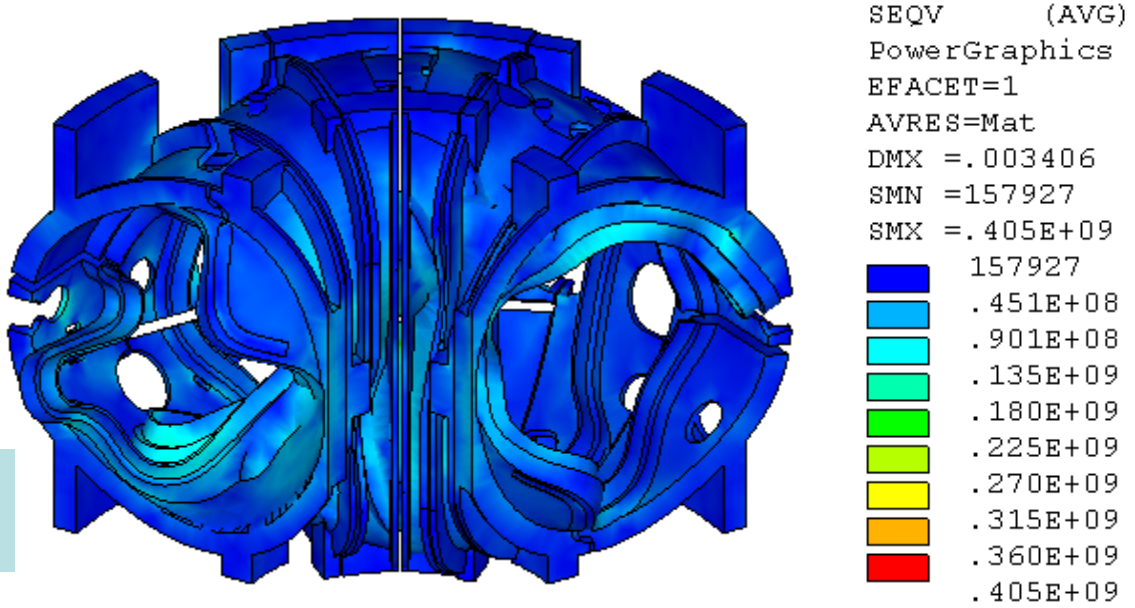
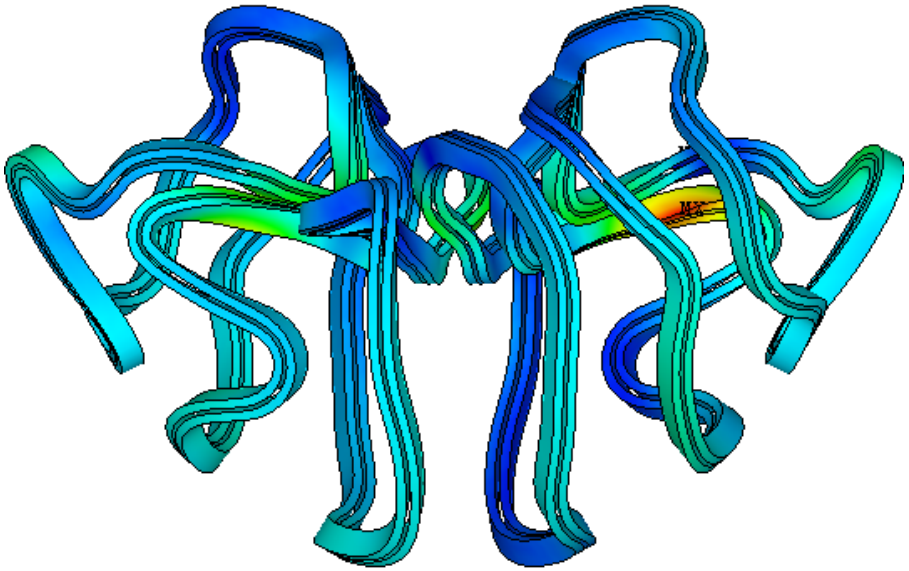
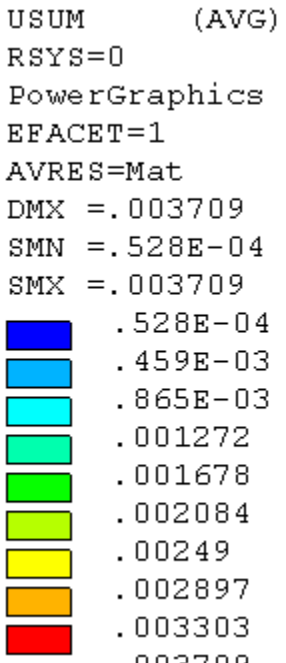
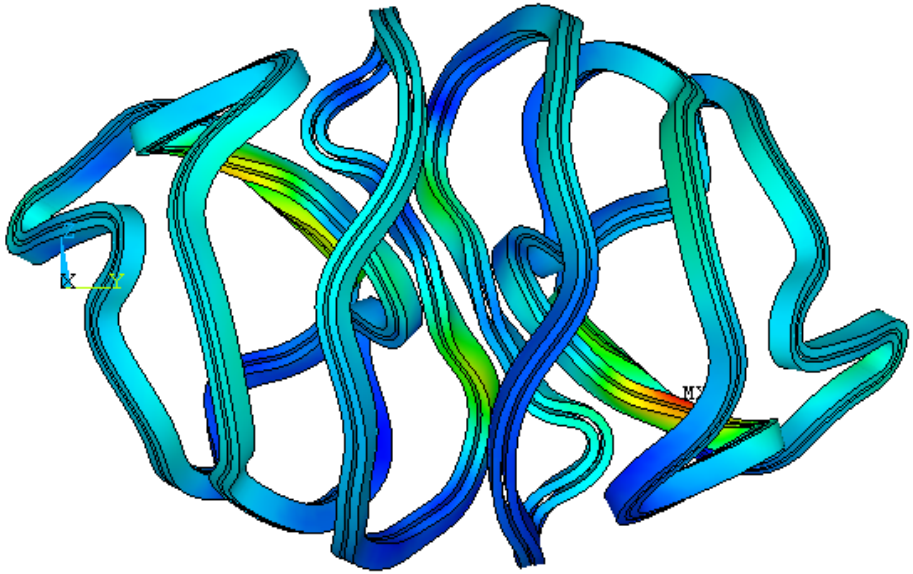


Modular Coil Displacements

- Dead Load + EM Load
- Wing Bags E = 2,908 MPa
- Flange shim E = 75,000 MPa
- Shell E = 100,000 MPa







Summary

	E of Flange Shim	E of MCWF	Max. MC Displacement	Max. MCWF Stress - Full	Max. MCWF Stress - PowerGraphics
Unit	MPa	MPa	mm	MPa	MPa
Case A	150,000	145,000	2.831	219	441
Case B	75,000	145,000	2.845	219	409
Case C	75,000	100,000	3.709	200	405

- The results are due to dead load + EM load.
- Base on the maximum stress location, the maximum stress defined by the full graphic option is more reliable.
- Reducing the E of flange shim by half has small effects on the maximum stress and maximum displacement
- Reducing the E of MCWF to 100,000MPa increases the maximum displacement by 30.4%
- The results are based on the assumption that all bolting joints are bonded without sliding which may be unconservative if the design can not match the requirement of the assumption.