

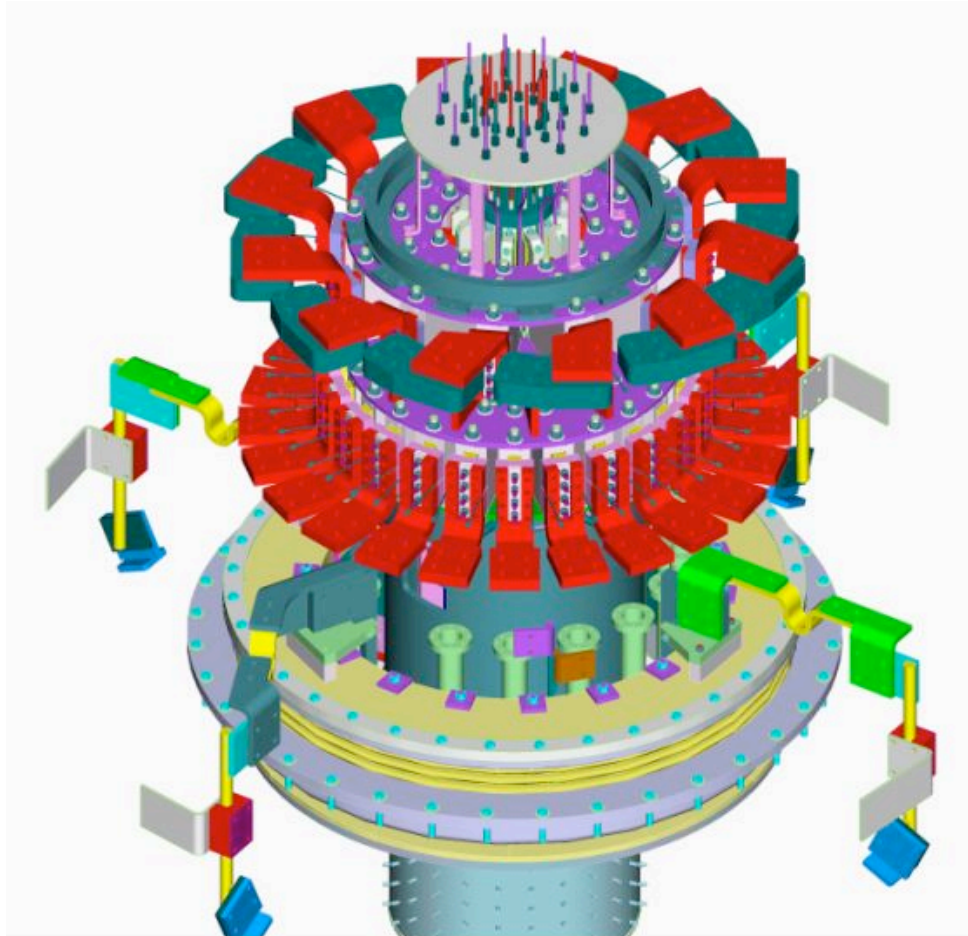
# NSTX TF Flag Joint

## *Status of Design, Analysis, Test Activities & Design Review Preparations*

C Neumeyer

NSTX Team Meeting 7/24/3

## DESIGN (Jim Chrzanowski and Bruce Paul)



## DESIGN

### ☐ Fabrication drawings issued for...

- conductors
- flags
- flag boxes
- shear shoes

### ☐ 3D modeling completed for remainder of design...

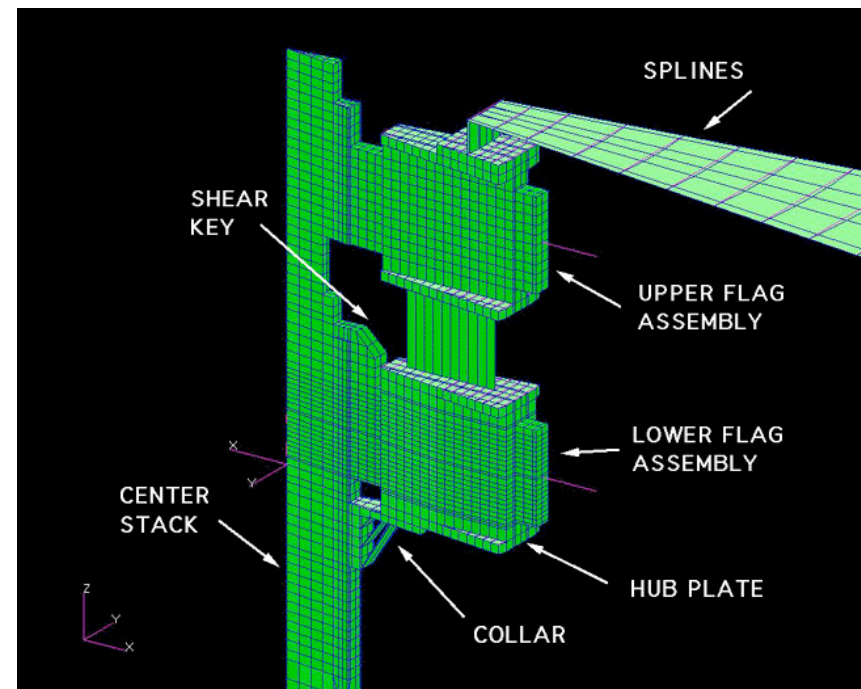
- hub
- coolant tube routing and bulkhead
- outer leg connections

...except for torque collar and its interface with hub

## ANALYSIS (Irv Zatz)

□ Finite Element Analysis has incorporated all aspects of the problem and is in active use in guiding the finalization of the design...

- both tiers of conductors
- out-of-plane load path through spline
- collar and wet lay-up representation
- in-plane, out-of-plane, thermal loads



## ANALYSIS

- ❑ Best design approach eliminates collar as a load path for the vertical force
  - use collar for inner bundle torsion only
  - friction and shear shoe are adequate for vertical load
  
- ❑ As soon as suitable collar design is established, analysis can be finalized

## COMPONENT TESTING (Mike Kalish et al)

### □ Pullout testing

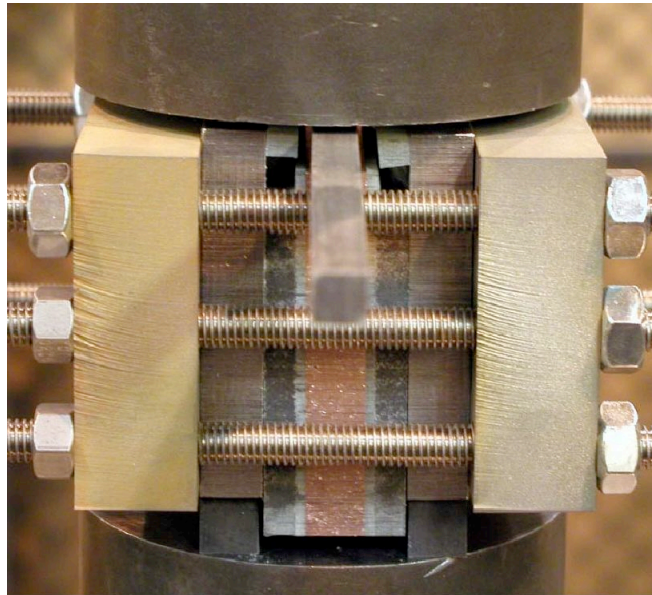
- pullout of inserts in copper at 100C complete (one time and cyclic)
- pullout of bolts in copper complete (one time and cyclic)



## COMPONENT TESTING

### ❑ Wet lay-up shear testing

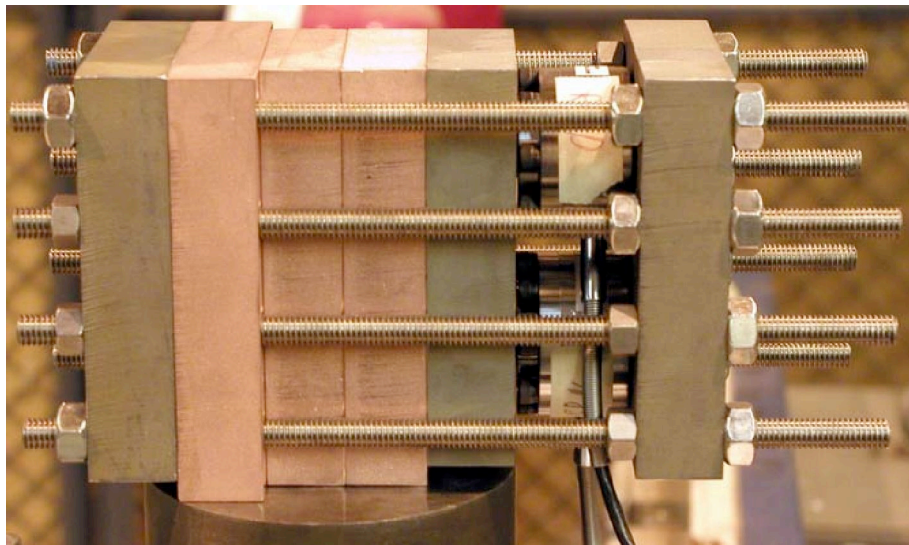
- four groups of six samples tested (one time and cyclic) one with improved Hysol epoxy
- fifth group of samples now under test



## COMPONENT TESTING

### ❑ Friction testing

- five samples tested at various compression levels to establish friction coefficient for silver plated copper



## PROTOTYPE TESTING

### ☐ Mechanical Prototype (M Kalish et al)

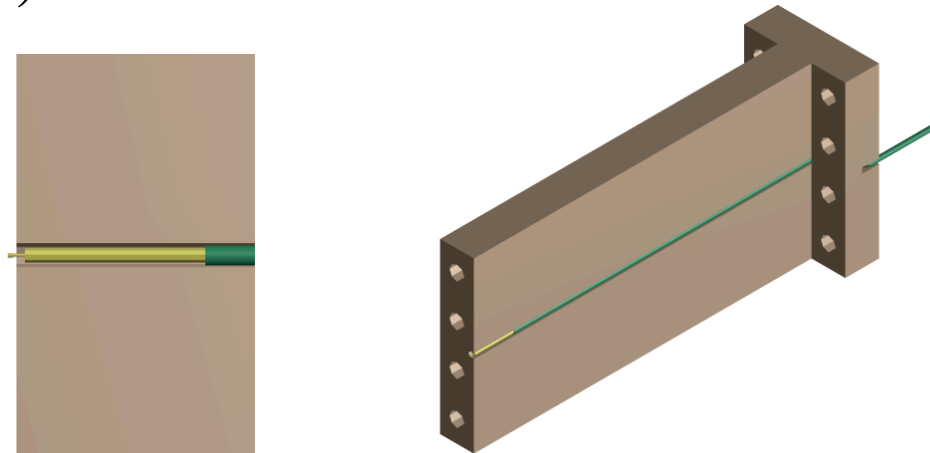
- fixturing and instrumentation preparations are in progress

### ☐ Electrical Prototype (Gene Baker et al)

- test stand is essentially complete
- instrumentation and protection preparations in progress

## INSTRUMENTATION (Hans Schneider and Bob Marsala)

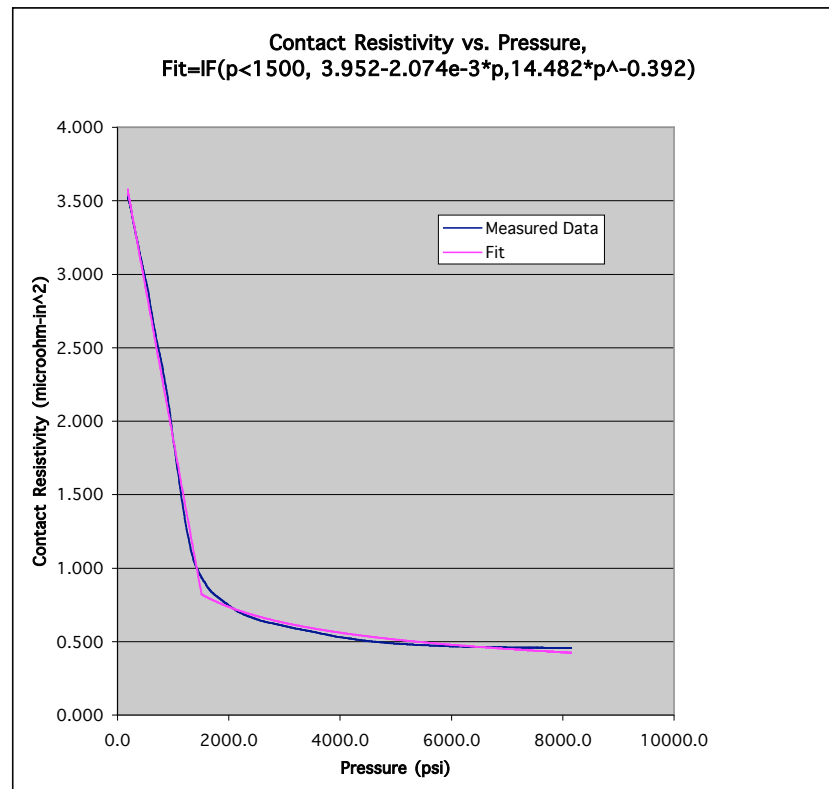
- ☐ Voltage probe scheme selected for joint voltage drop (resistance) measurement



- ☐ Will implement system to measure resistance at (200A) and voltage drop during operations on all 72 joints
- ☐ Strain, temperature, displacement measurements still undecided

## INSTRUMENTATION

- ❑ Tested measurement technique and characterized silver plated copper joint resistance vs. pressure behavior



## DESIGN REVIEW PREPARATIONS

- ☐ Preliminary package goes out next Thurs, July 31
  - overview document
  - chit resolution document
  - set of drawings
  
- ☐ Dry runs begin Mon, Aug 4
  
- ☐ Review convenes on Thurs, Aug 7