

# Comparison of 2-FP and 3-FP CS Coil Geometry Configurations



UC San Diego



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# Outline

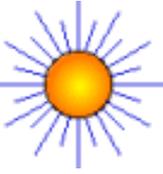


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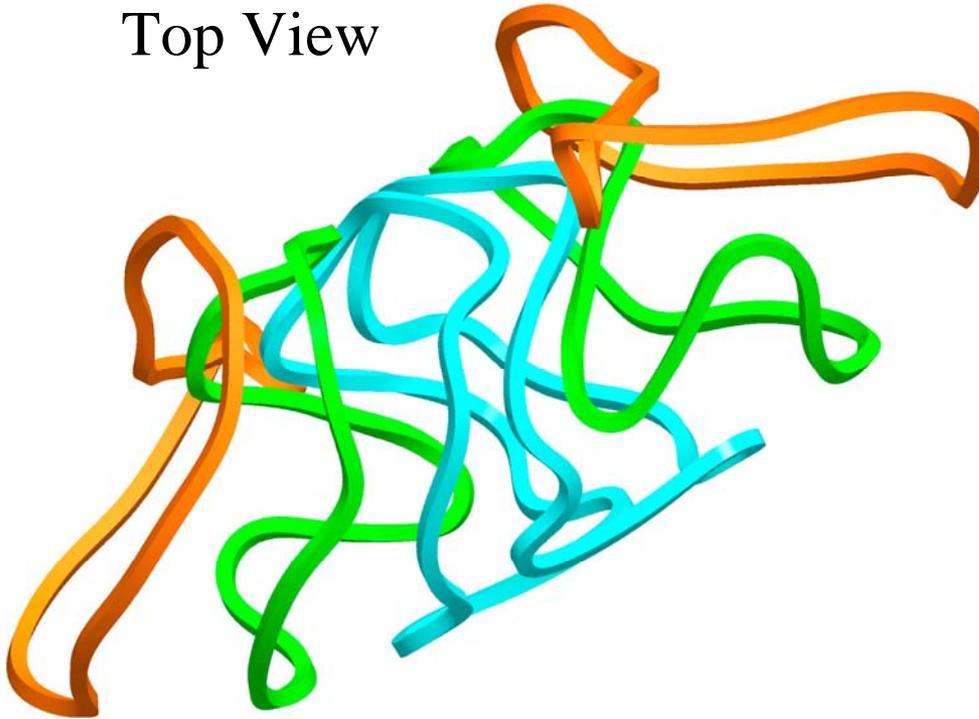


- Update of 2-FP coil geometry configuration
  - New geometry of 2-FP coils
  - Layout of maintenance ports
- Comparison of 2-FP and 3-FP coil geometry
- Summary

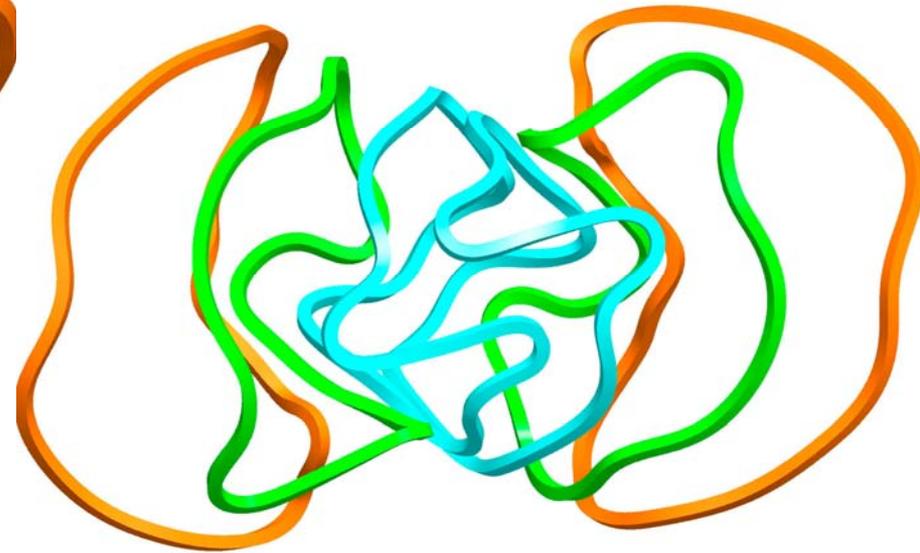
# Review of 3-FP Coil Geometry Configuration



Top View

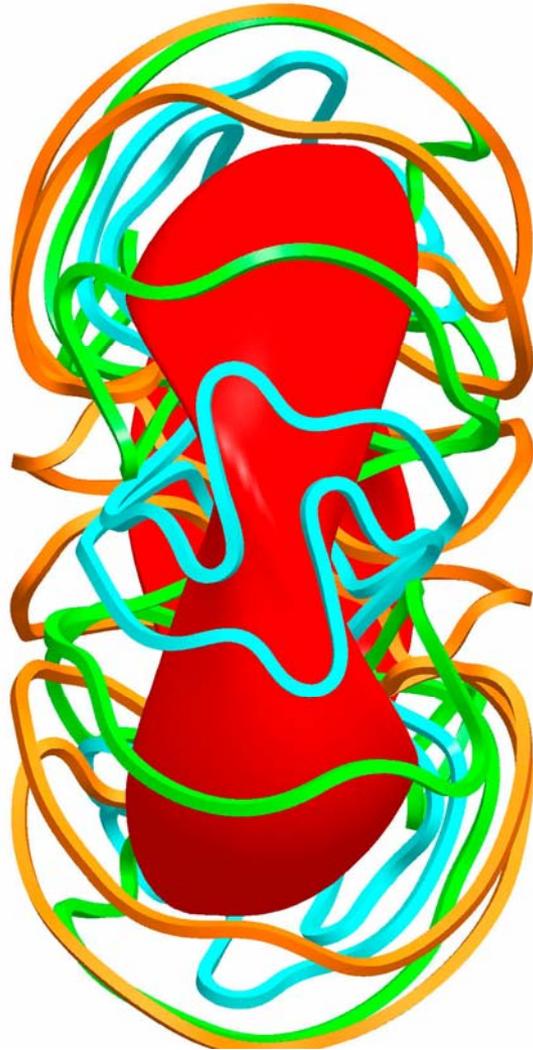


Left View



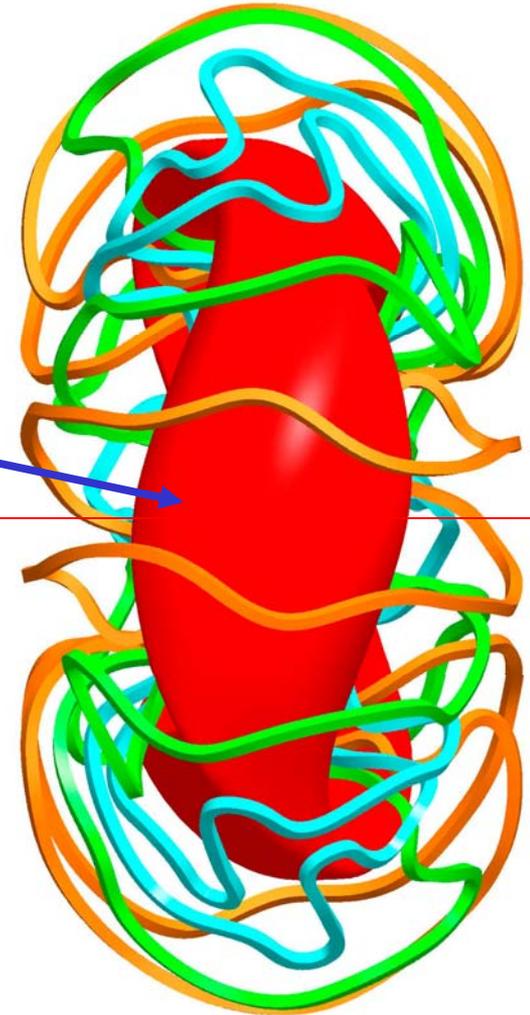
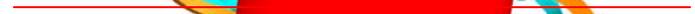
\*Based on  $R=8.25$  m case, the cross-section of coil is about  $0.33 \times 0.33$  m<sup>2</sup>

# Review of 3-FP Coil Geometry Configuration



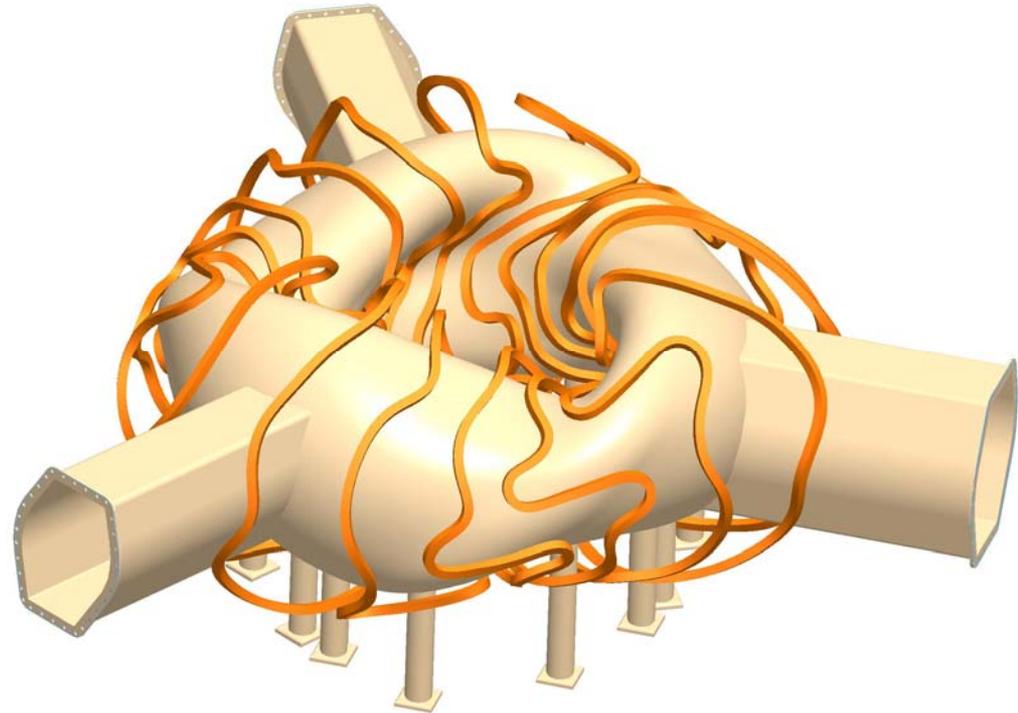
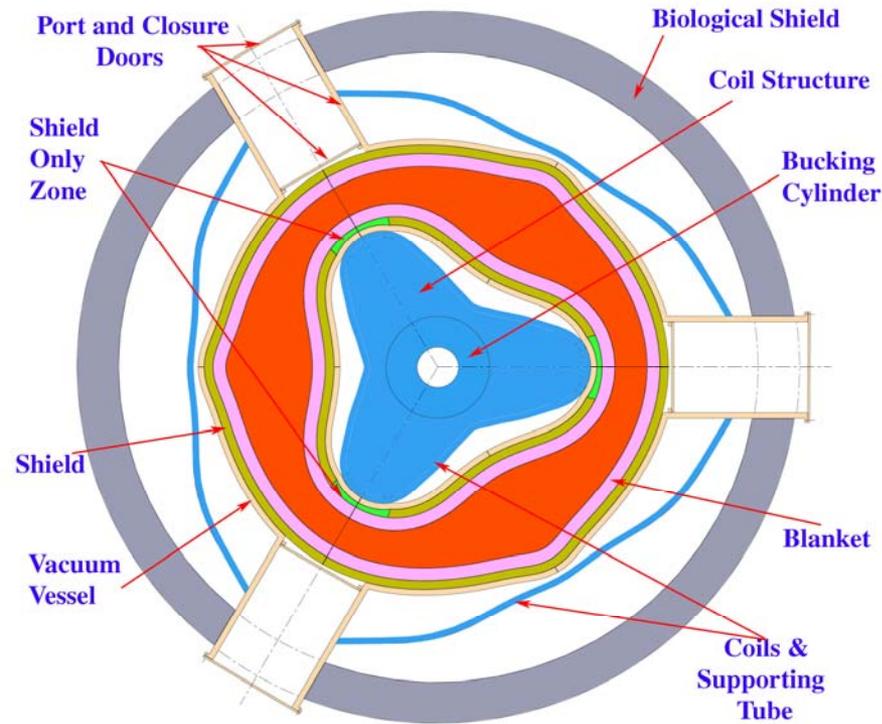
Left View

Port  
Location



Right View

# Review of the Modular Maintenance Scheme for 3-FP



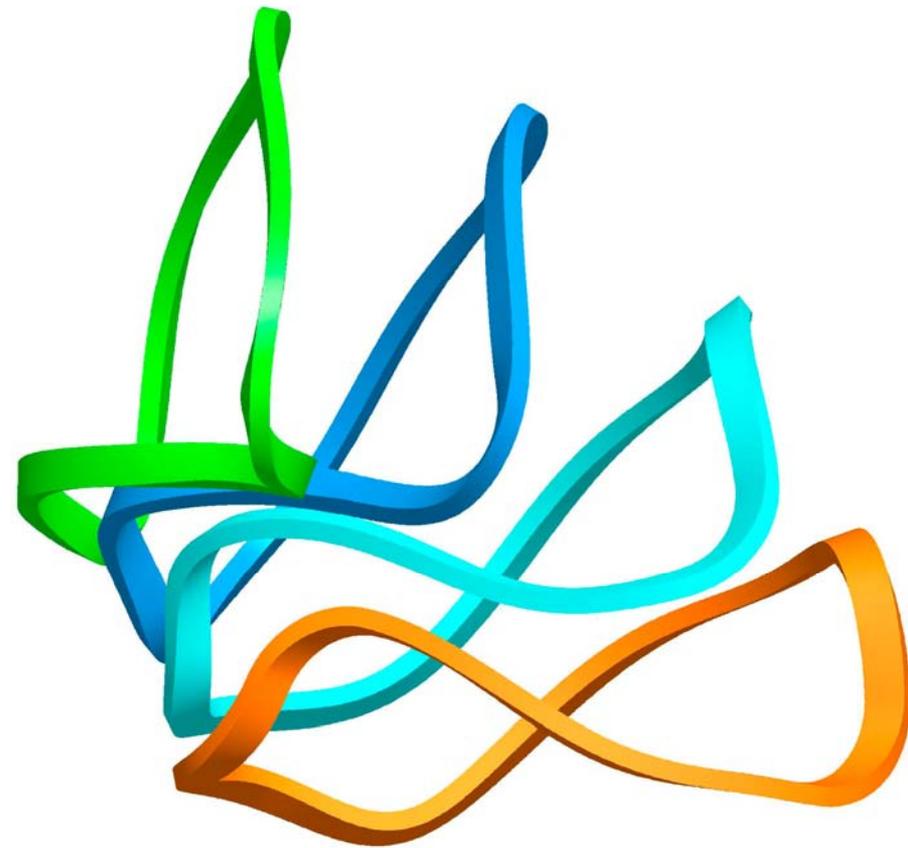
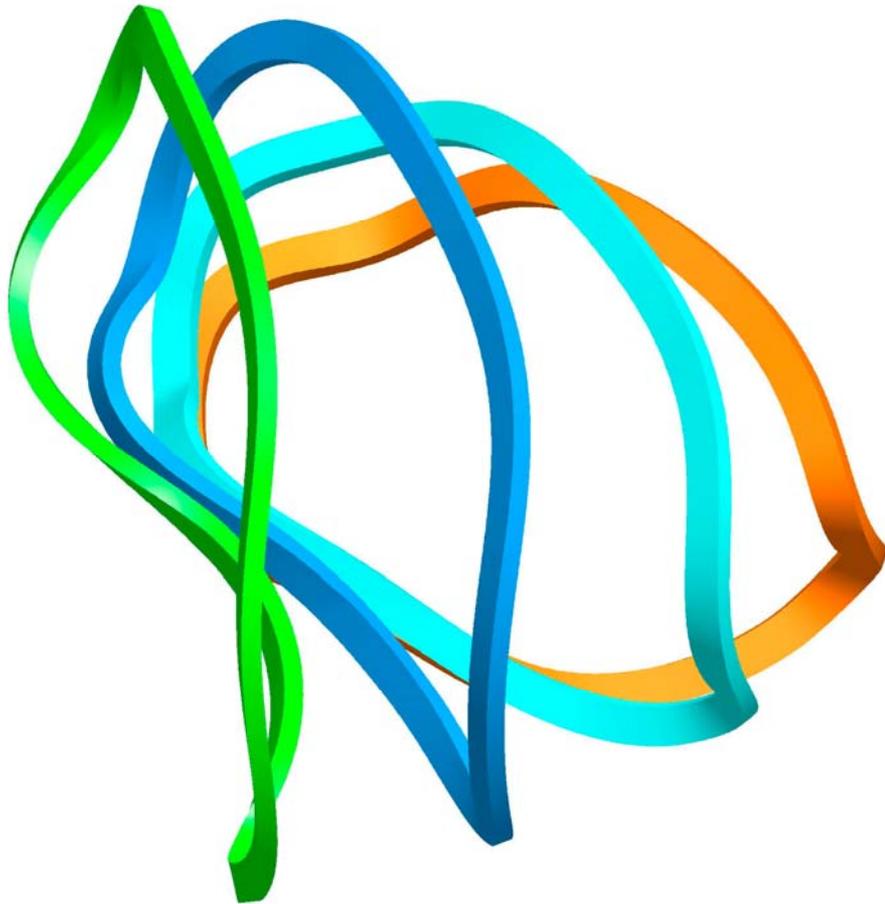
- Initial findings indicated the possibility of a modular maintenance scheme utilizing articulated booms for replacing module of sizes  $\sim 2$  m (tor.) x 2 m (pol.) FW module.
- It is possible to add two more ports per field-period if required.

# New Coil Geometry of 2-FP Configuration



Side View

Top View

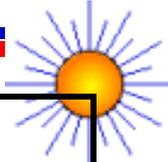


\*  $a=1$  m, Aspect Ratio =2.75, Cross-section  $0.12 \times 0.24$  m<sup>2</sup>

# Comparison of Port Access Area Between Adjacent Coils for 2 Different Configuration



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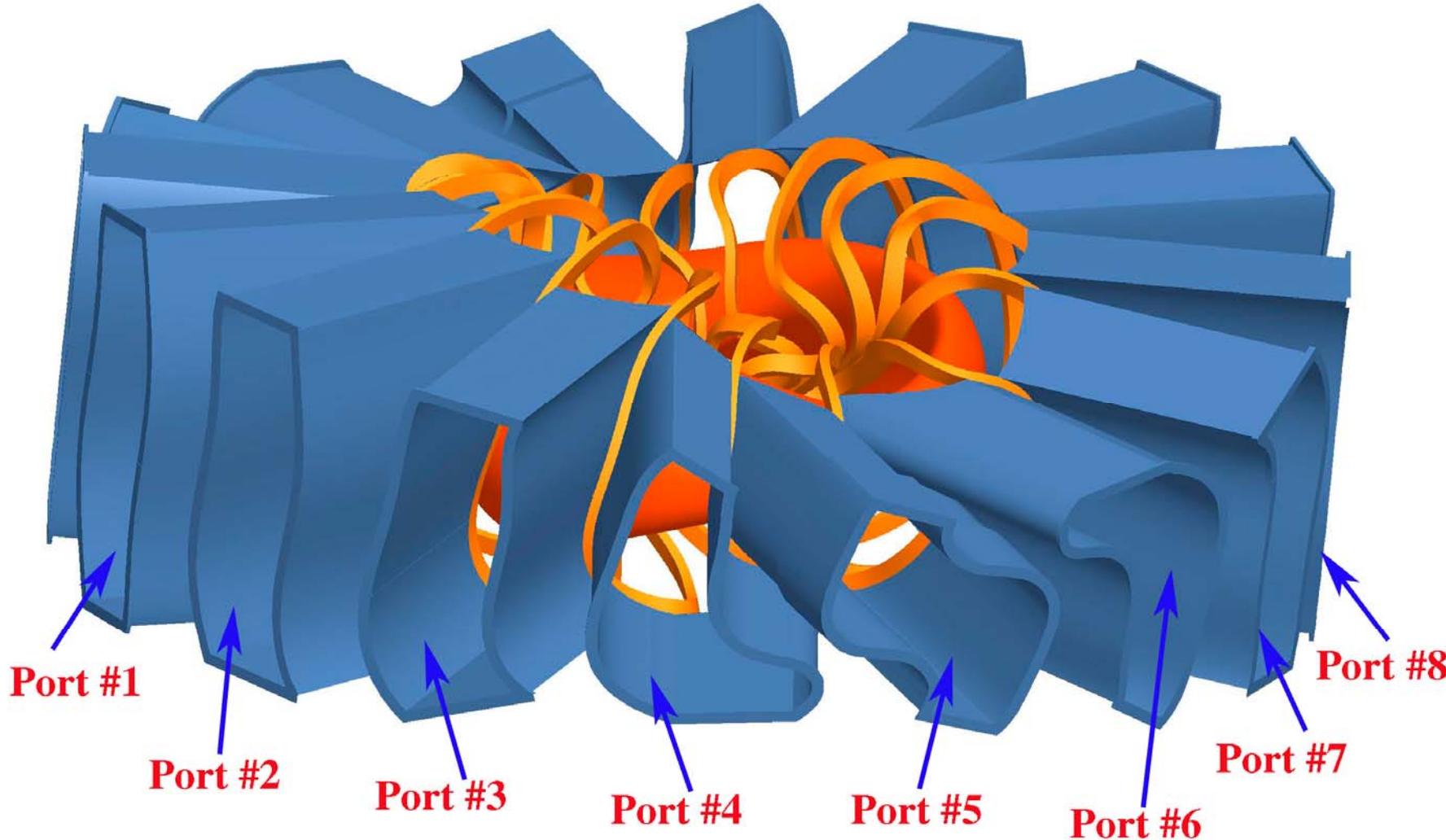
	R=8.25 m (3 FP, 18 coils)	R=8.0 m (2 FP, 16 coils) (New)
Port #1	3.4 x 9.6 (Horizontal)	3.9 x 14.6 (Horizontal)
Port #2	3.1 x 9.4 (Horizontal)	3.8 x 13.5 (Horizontal)
Port #3	2.6 x 4.9 (45° from top)	4.1 x 10.3 (Horizontal)
Port #4	1.5 x 5.8 (Horizontal)	4.2 x 8.7 (Horizontal)
Port #5	2.6 x 4.9 (135° From bottom)	4.2 x 7.2 (Horizontal)
Port #6	3.1 x 9.4 (Horizontal)	4.2 x 8.7 (Horizontal)
Port #7		4.1 x 10.3 (Horizontal)
Port #8		3.8 x 13.5 (Horizontal)

Available port sizes are shown. Actual port sizes would depend on coil structure requirement for stress accommodation.

# Layout of Maintenance Ports Between Each Pair of Coils



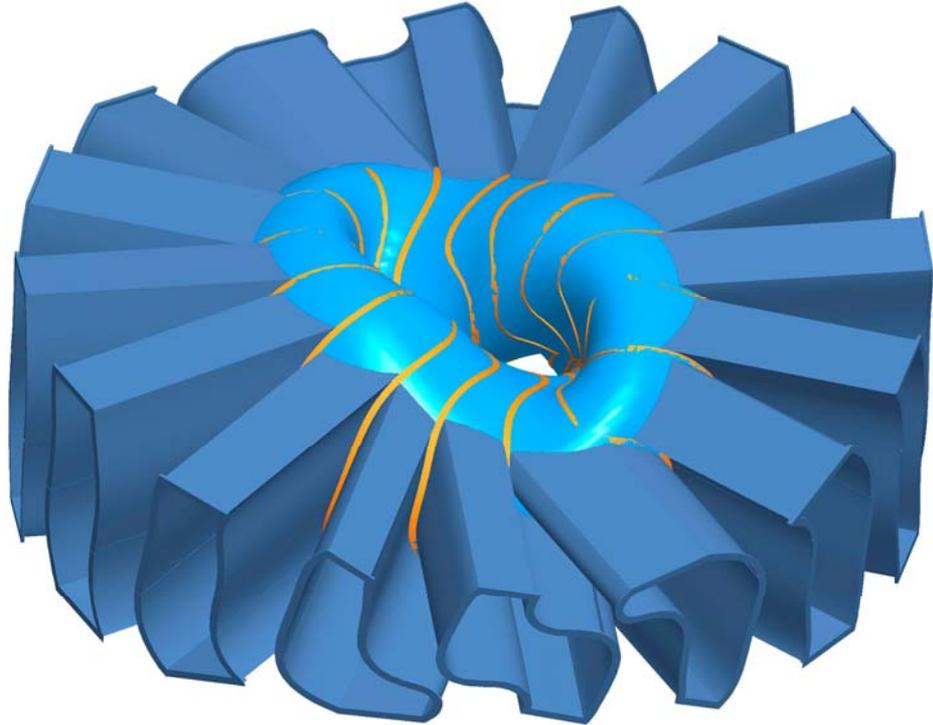
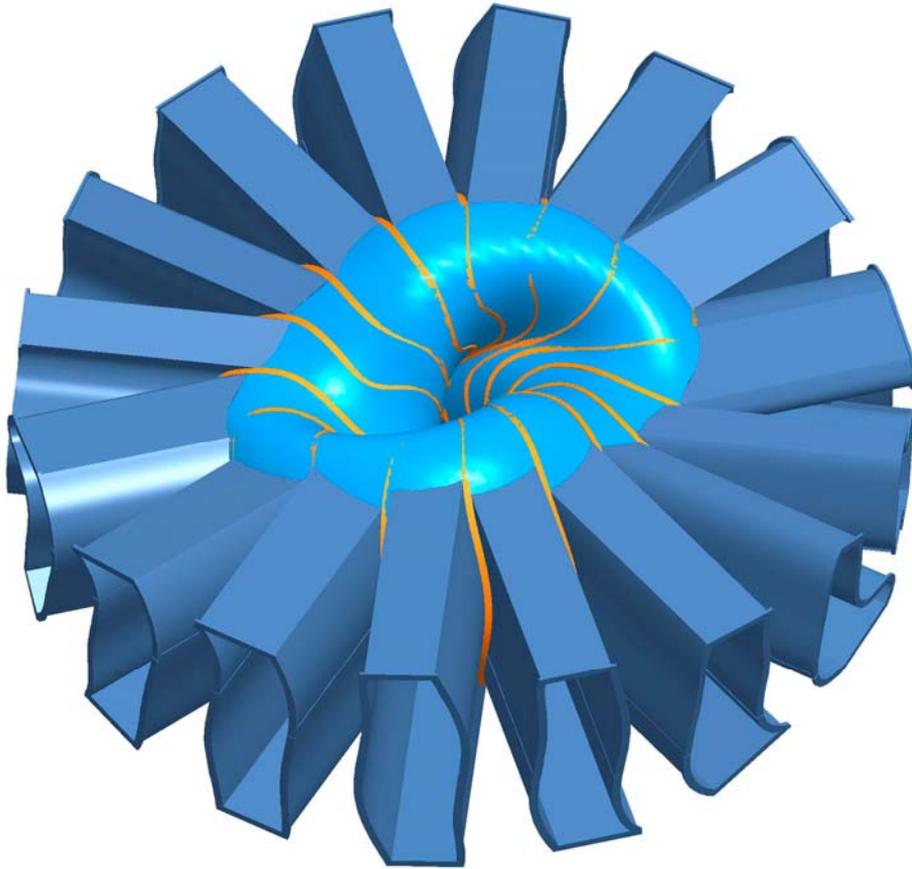
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# Layout of Maintenance Ports Between Each Pair of Coils(Cont.)



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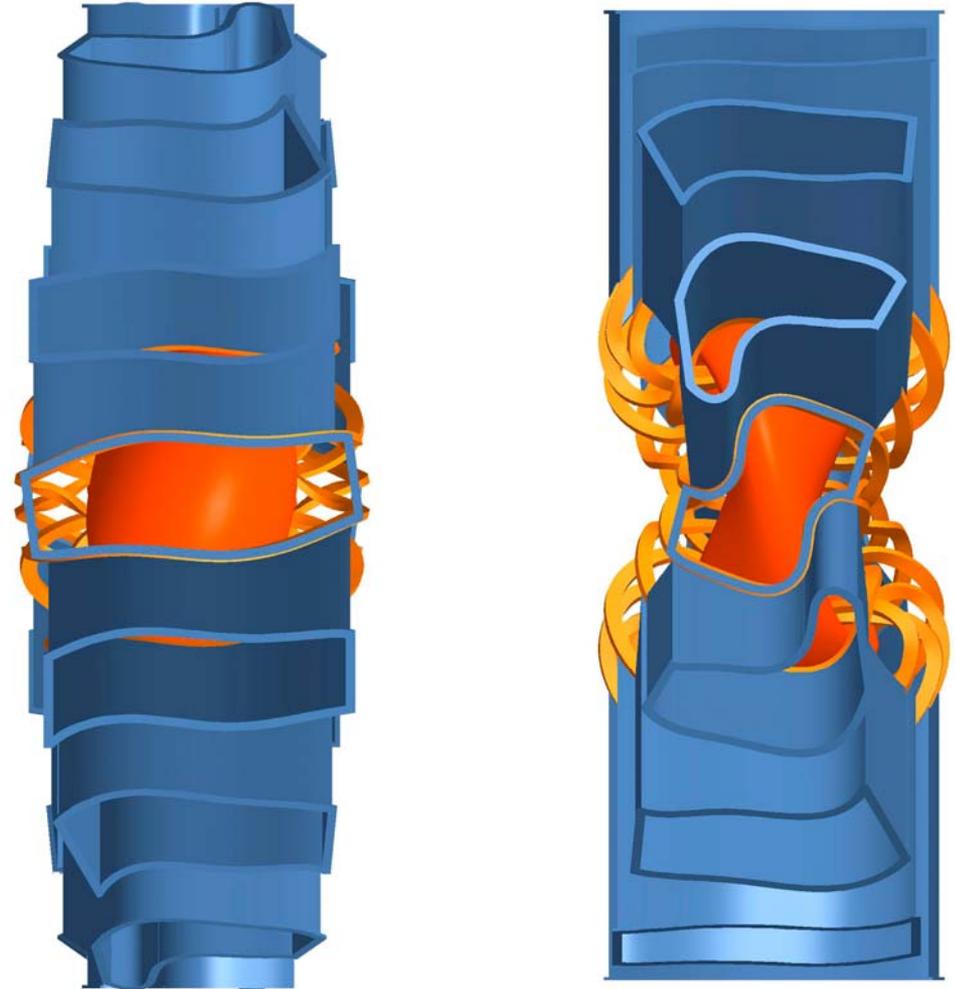
# Maintenance Approach with Ports Between Each Pair of Adjacent Coils Is Attractive for MHH2



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- 2 FP configuration provides more room for maintenance ports, and blanket modules could be maximized to suit the size of ports.
- Number of the blanket modules is far less than that of modular maintenance approach through selected ports with articulated boom.
- Detailed analysis would be needed to design the maintenance ports between each pair of coils and to segment the blanket.



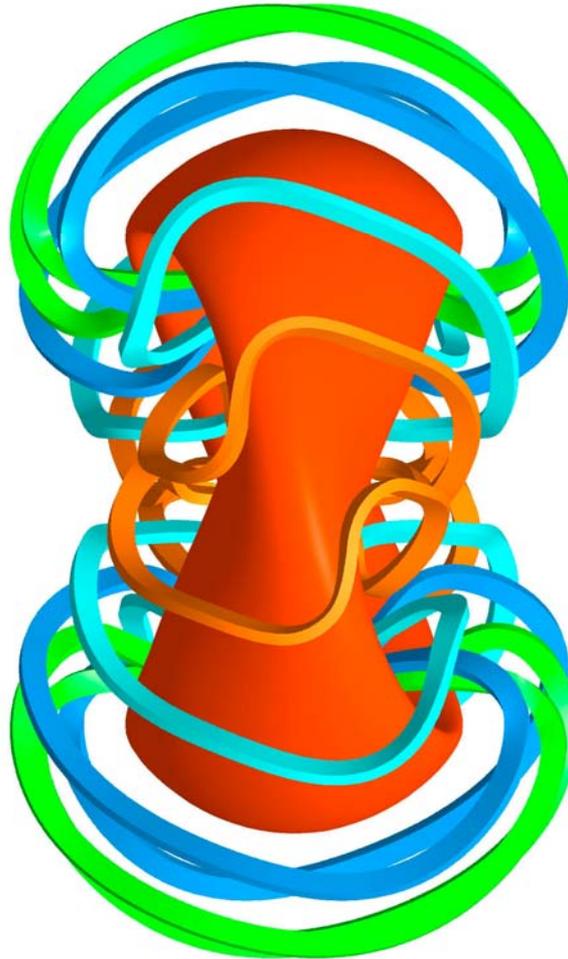
# Comparison of 2-FP and 3-FP Coil Geometry



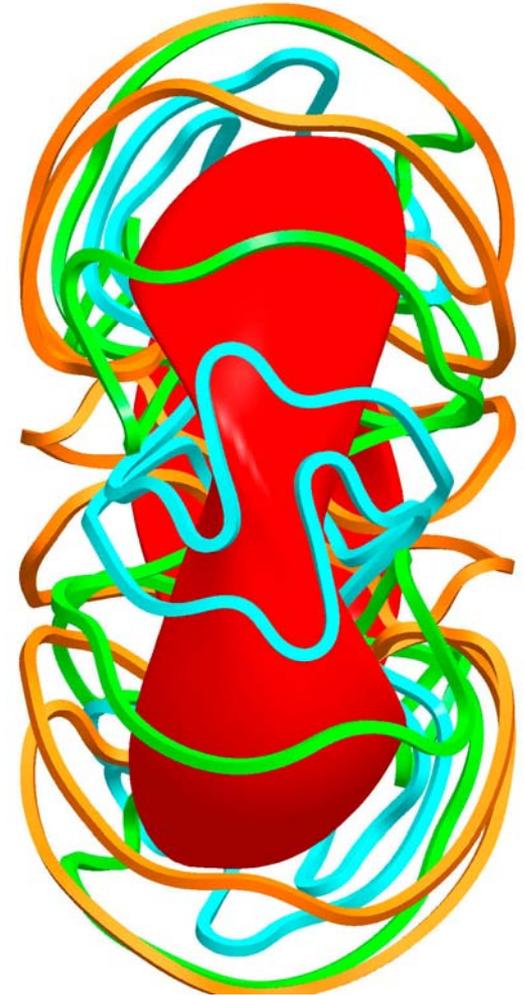
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- 2 FP coil shapes are only moderately twisted and are well separated (showing in Top View).
- 2 FP coil configuration provide ample space between each pair of coils.
- 2-FP coil configuration provides an easy access from outside, and all 16 maintenance ports can be arranged in horizontal.

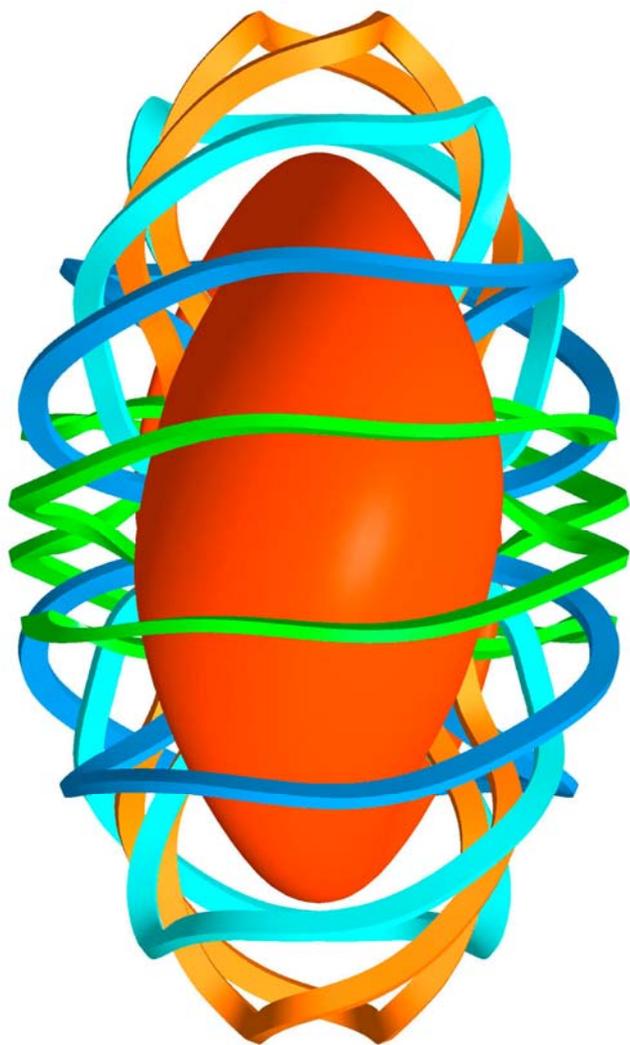
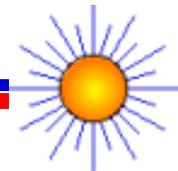


Left View(2-FP)

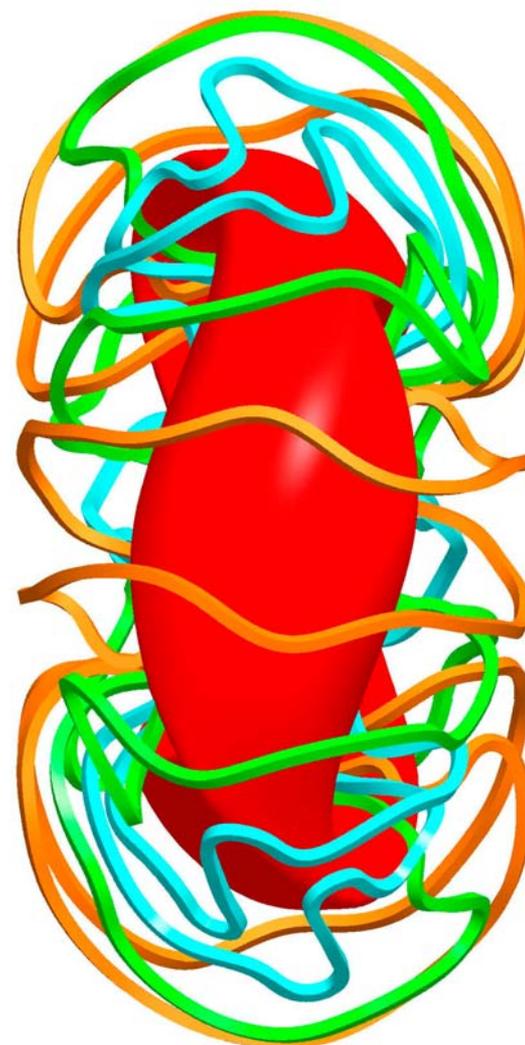


Left View(3-FP)

# Comparison of 2-FP and 3-FP Coil Geometry(cont.)

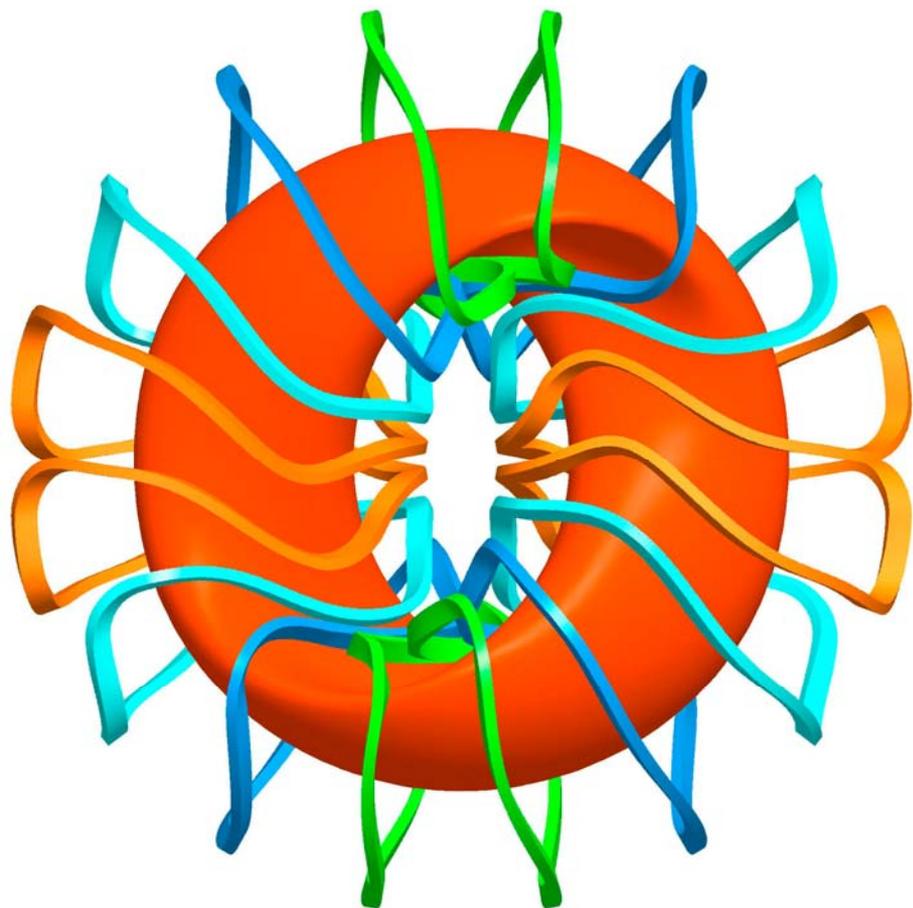
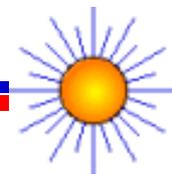


Right View(2-FP)

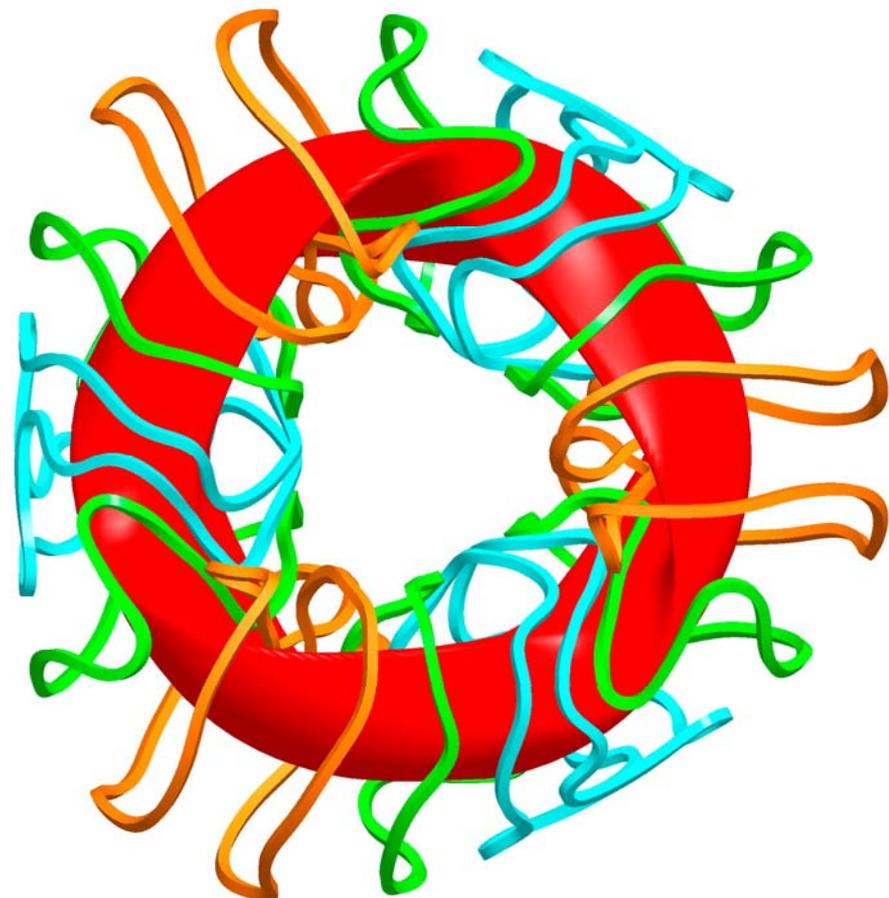


Right View(3-FP)

# Comparison of 2-FP and 3-FP Coil Geometry(cont.)



Top View(2-FP)



Top View(3-FP)

# Summary



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- 2 FP coil shapes are only moderately twisted and are well separated.
- 2 FP configuration provides more room for maintenance ports, and blanket modules could be maximized to suit the size of ports.
- All 16 ports can be horizontally arranged.
- Maintenance approach with ports between each pair of adjacent coils is attractive for MHH2.