Modular Coil Design for NBI Access

D. Strickler, M. Cole, B. Nelson, D. Williamson

NCSX Engineering Meeting

10/11/2000

- Goal: provide space for NBI
- Options examined with CoilOpt:

  $N_c = 6$ (modular coils per field period)

  $N_c = 7$ – move coil 4 inward

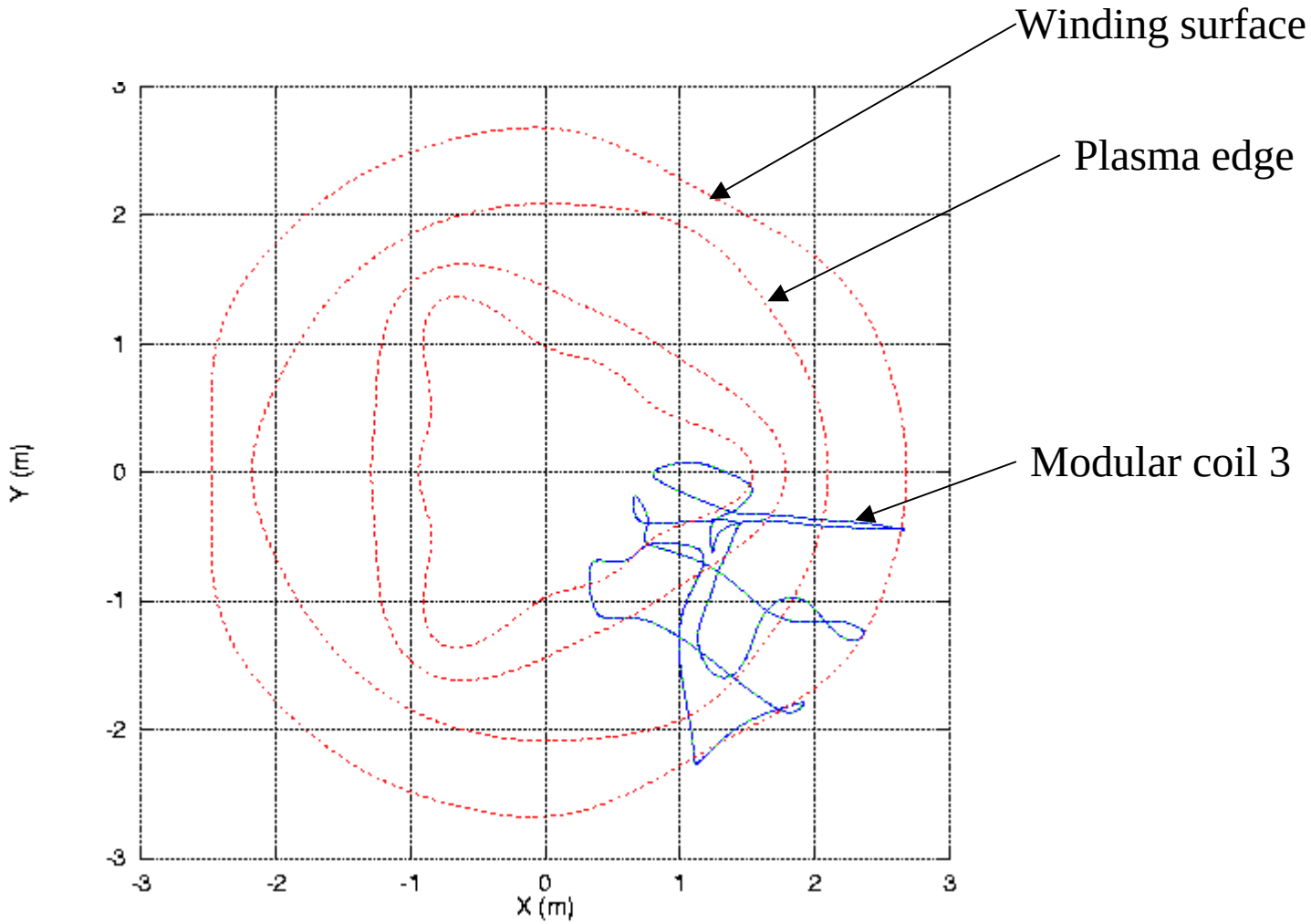
  $N_c = 7$ – stretch coil 4
- Free-boundary reconstructions

Modular Solutions for LI383

ID#	N_c	δB_{avg} (%)	δB_{max} (%)	$\Delta_{cc,min}$ (cm)	$\Delta_{cp,min}$ (cm)	ρ_{min} (cm)	$R_{4,max}$ (m)
0907a1	7	0.57	2.67	13.6	23.2	11.1	2.64
1005b8	6	1.13	6.61	13.6	23.7	12.26	
0929a1	7	0.68	4.67	14.1	22.4	11.2	2.56
1009a1	7	0.62	2.74	14.1	23.3	12.4	3.65

Modular Coils for LI383

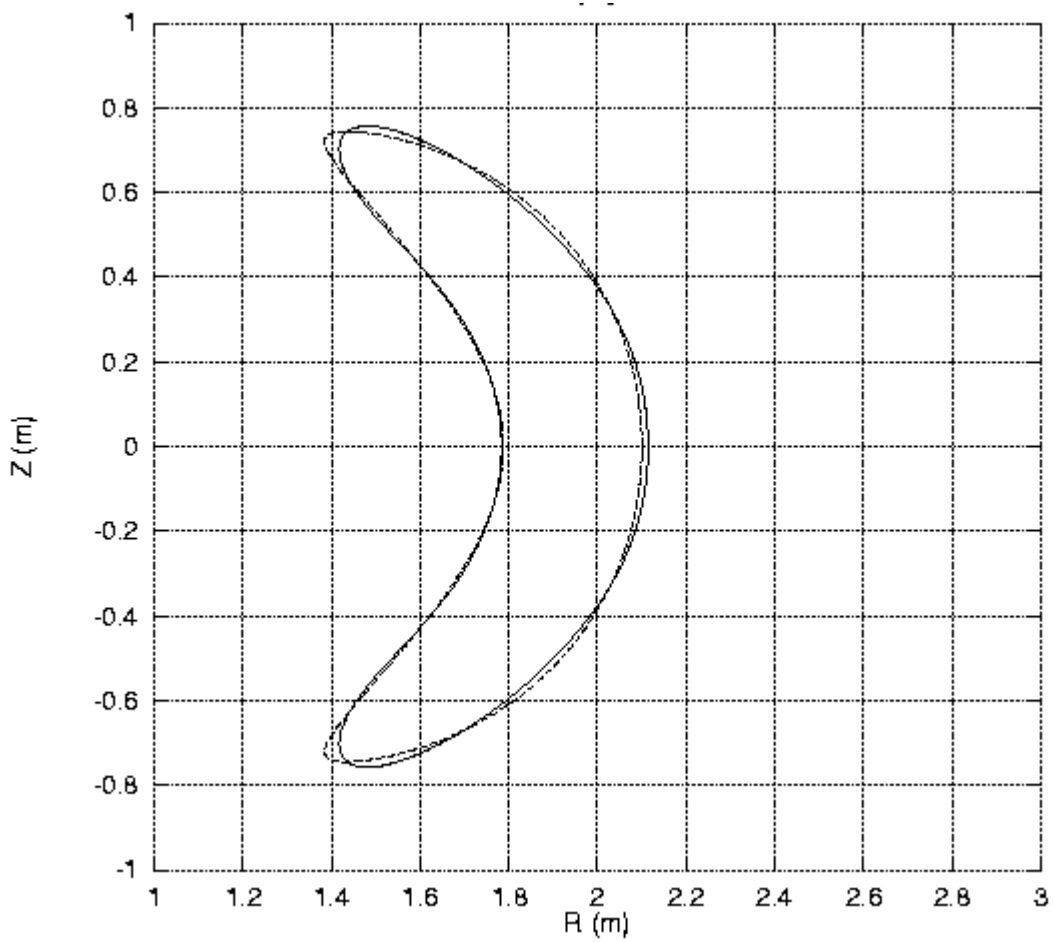
Solution 1005b8 – N_c=6



Free-boundary Reconstruction of LI383

Modular Coil Solution 1005b8 – N_c=6

v = 0

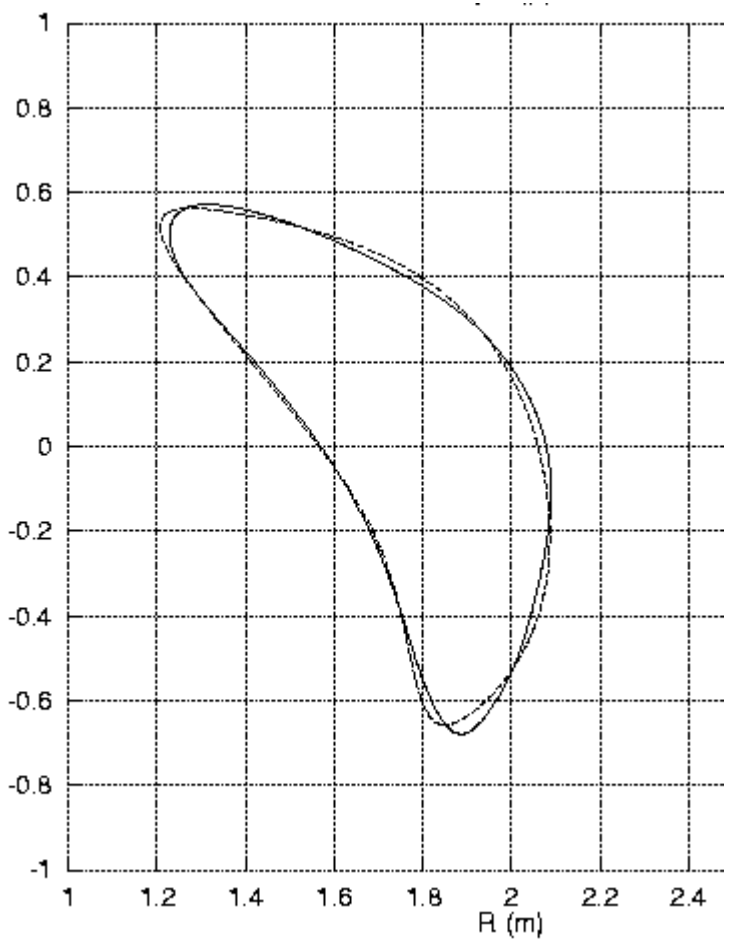


	Free	(Fixed)
A =	4.38	(4.37)
R =	1.74m	(1.73m)
ι(0) =	0.39	(0.39)
ι(1) =	0.65	(0.65)
β =	4.23%	(4.25%)

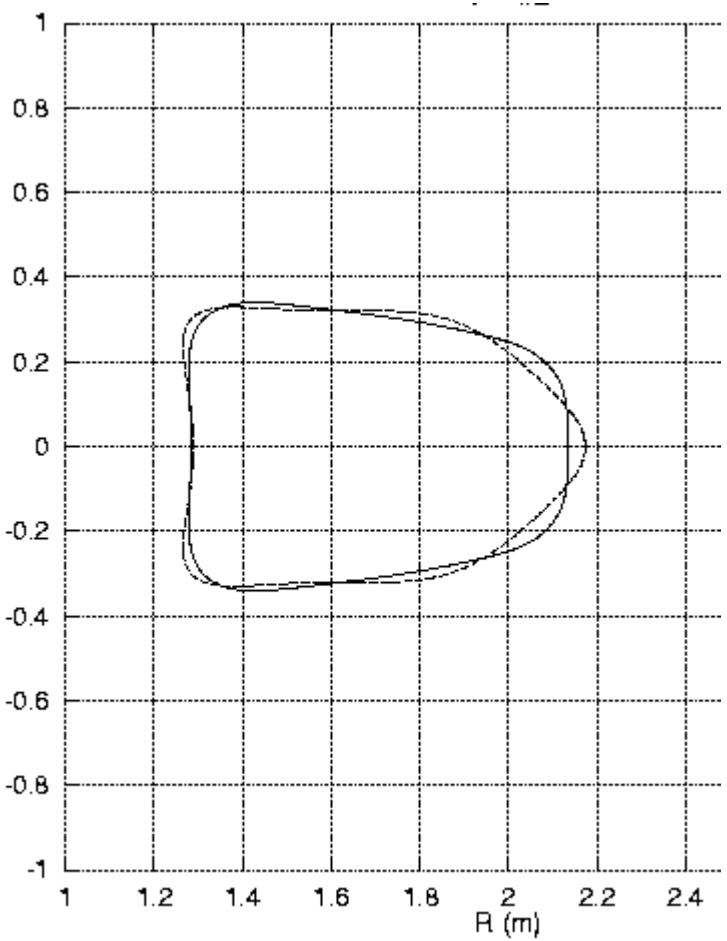
Free-boundary Reconstruction of LI383

Modular Coil Solution 1005b8 – N_c=6

v = 1/4

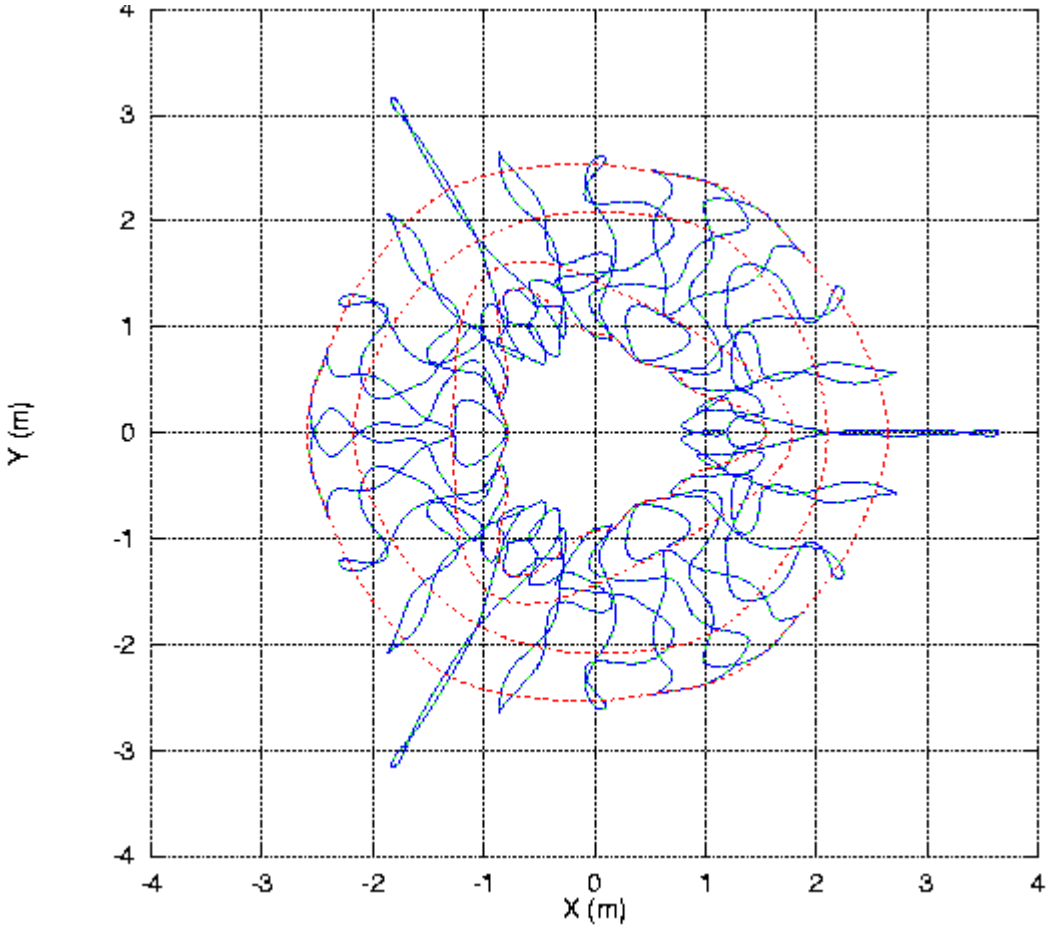


v = 1/2



Modular Coils for LI383

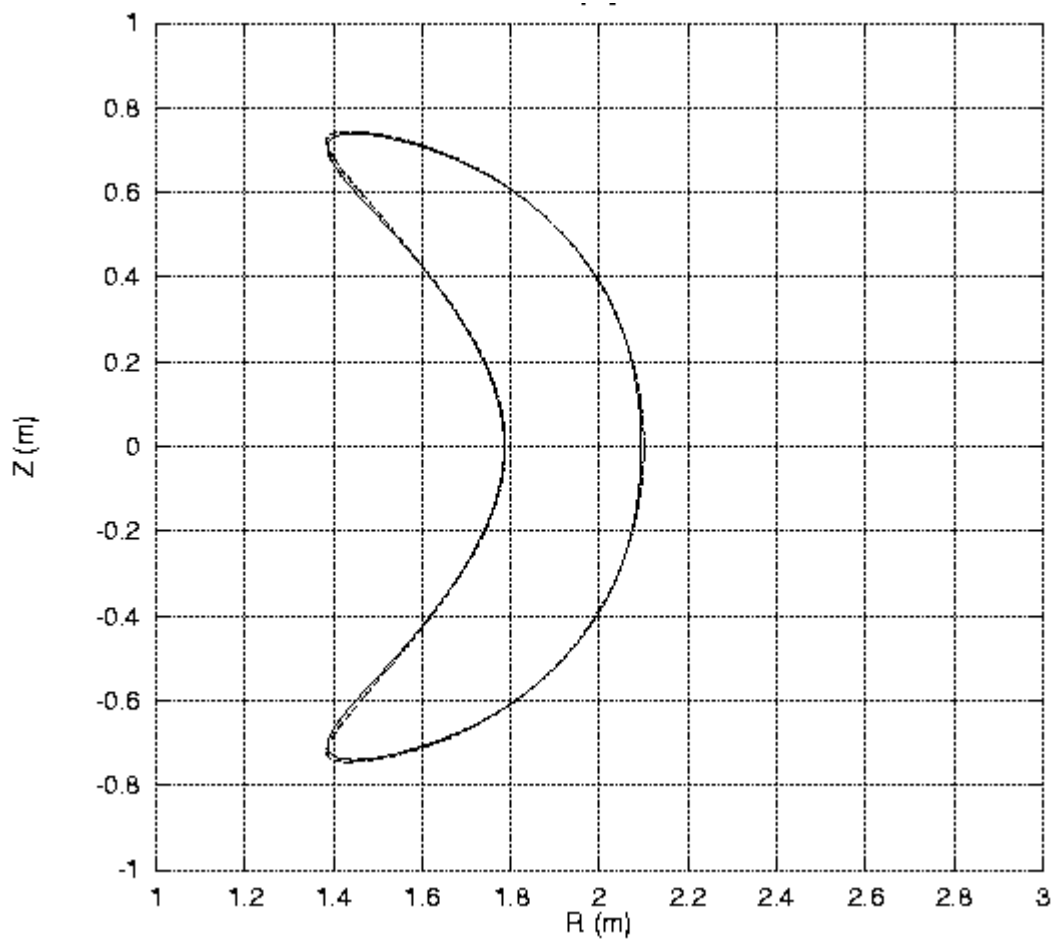
Solution 1009a1 – N_c=7



Free-boundary Reconstruction of LI383

Modular Coil Solution 1009a1 – N_c=7

v = 0

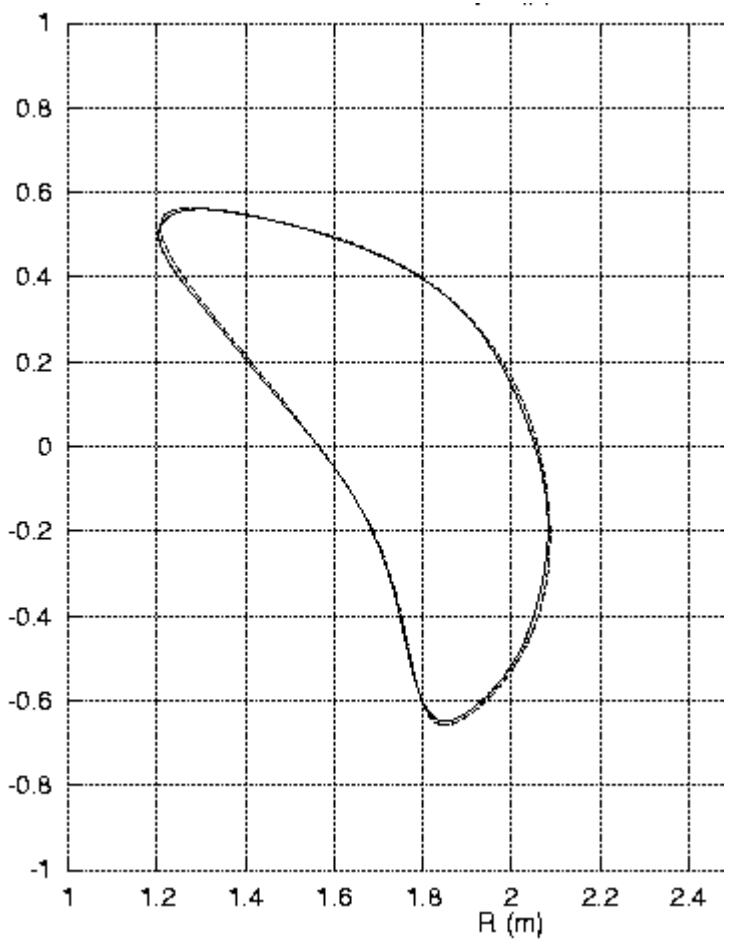


	Free	(Fixed)
A =	4.36	(4.37)
R =	1.73m	(1.73m)
ι(0) =	0.41	(0.39)
ι(1) =	0.65	(0.65)
β =	4.21%	(4.25%)

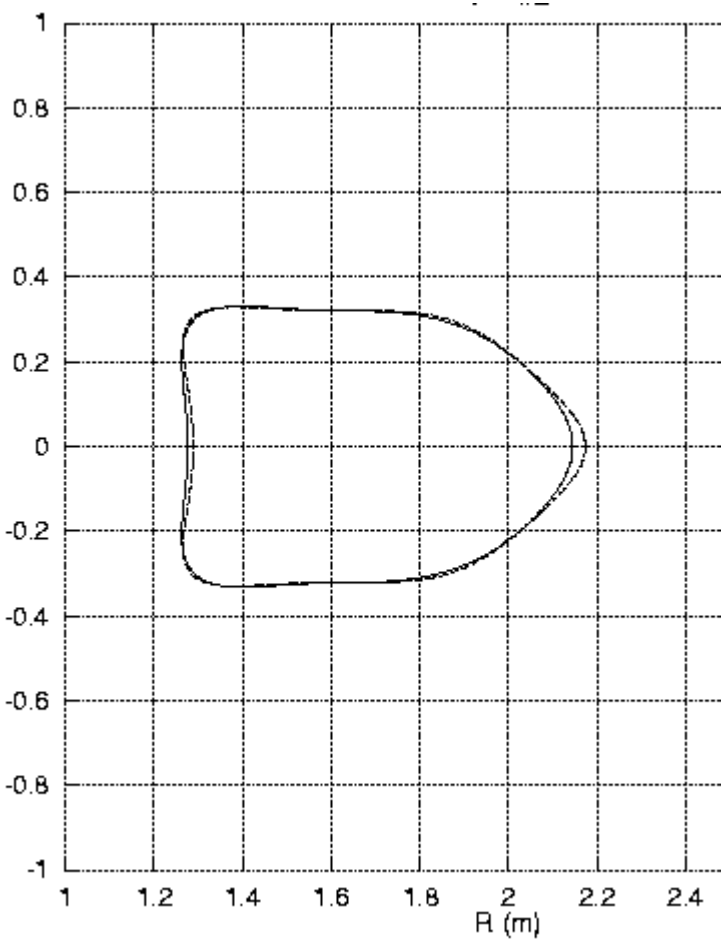
Free-boundary Reconstruction of LI383

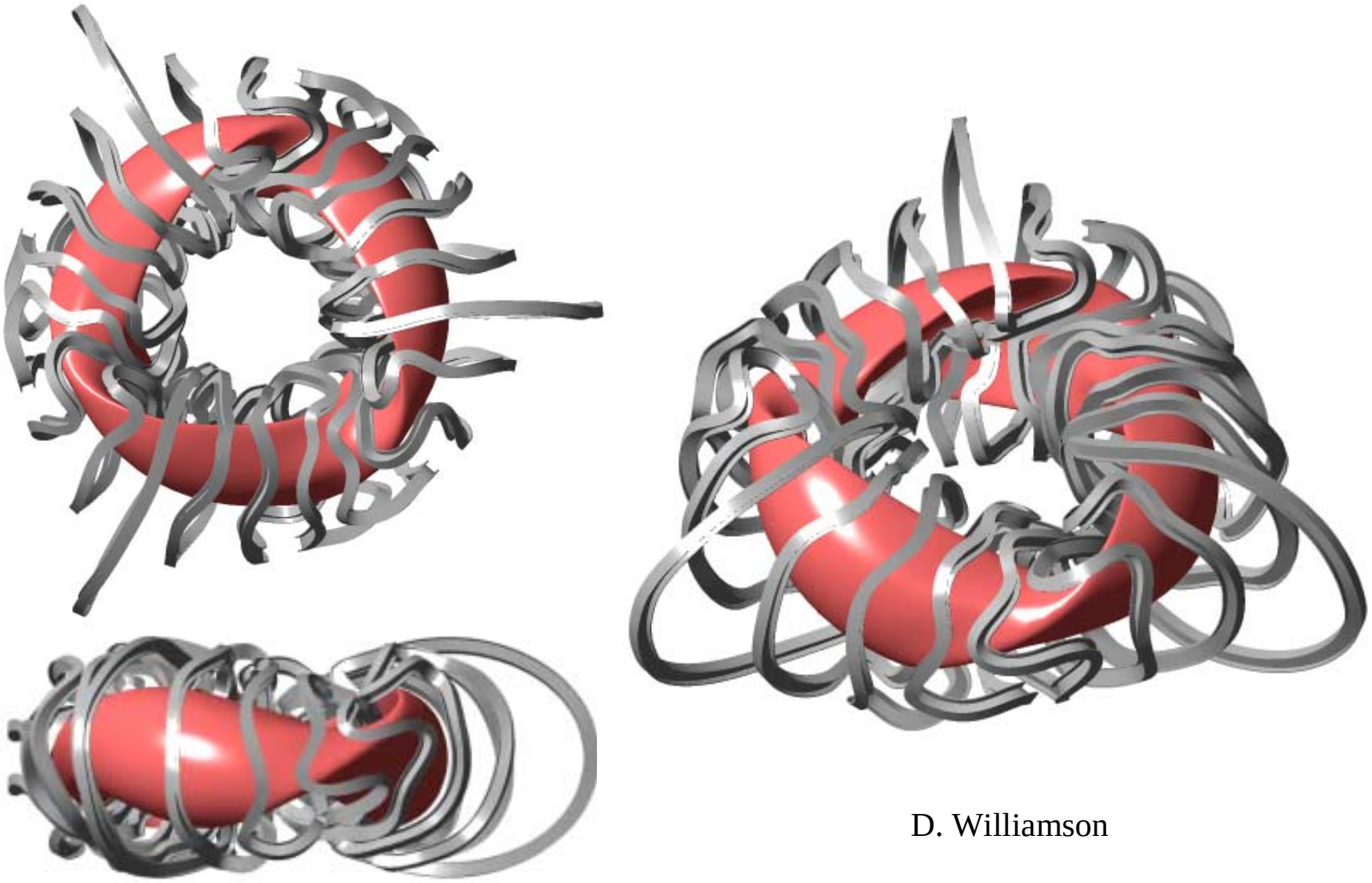
Modular Coil Solution 1009a1 – N_c=7

v = 1/4



v = 1/2





D. Williamson