Compatibility for ILC Cryomodule

Steps to the Compatibility

Proposal	Candidate A	Candidate B	Candidate C
Spec. Table	Example for Coupler ; Operating Condition, Processing Condition, Tune-ability, Heat Load,.....		
Evaluation	Need to make Some Score Sheets.		
Selection	By PM		
Compatible Modification	Construction Scenario, Commissioning Scenario, Maintenance Scenario,..... Level of Compatibility		

Score Sheet for Selection

	Weight	Candidate A	B	C
Performance	100			
Cost	80			
Operating Experience	50			
Risk, Availability	50			
Assembly Simplicity	30			
Regional Situation	50			

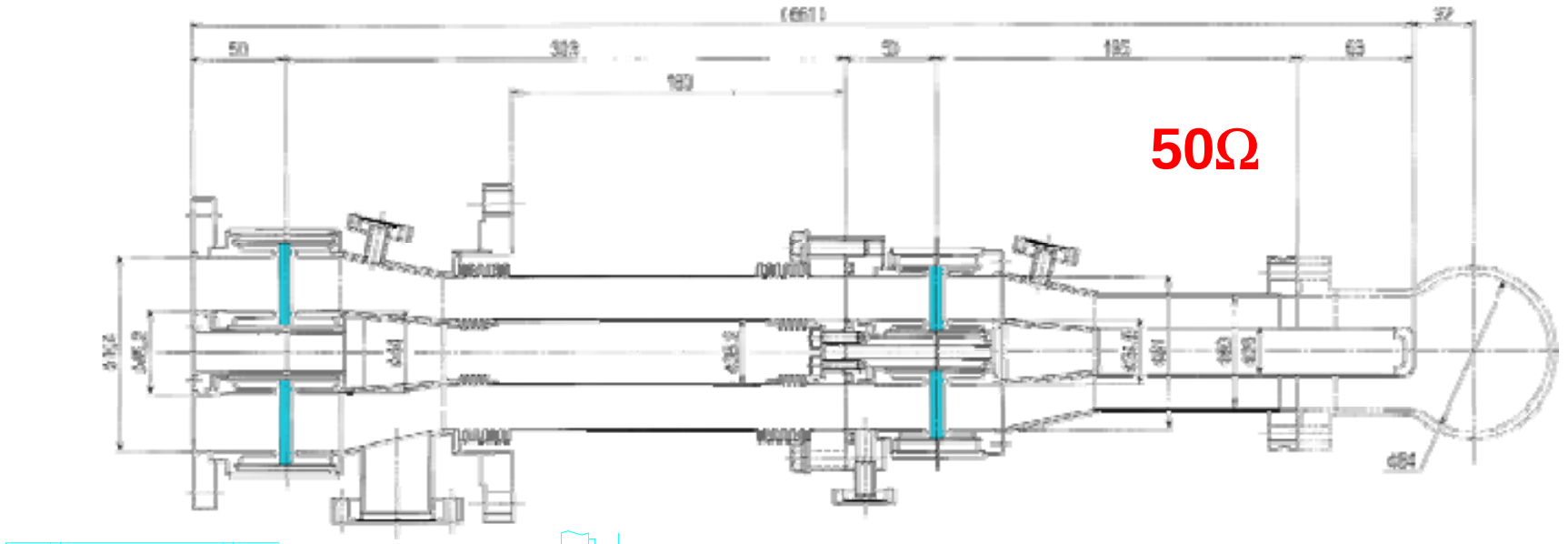
Major Alternative Components

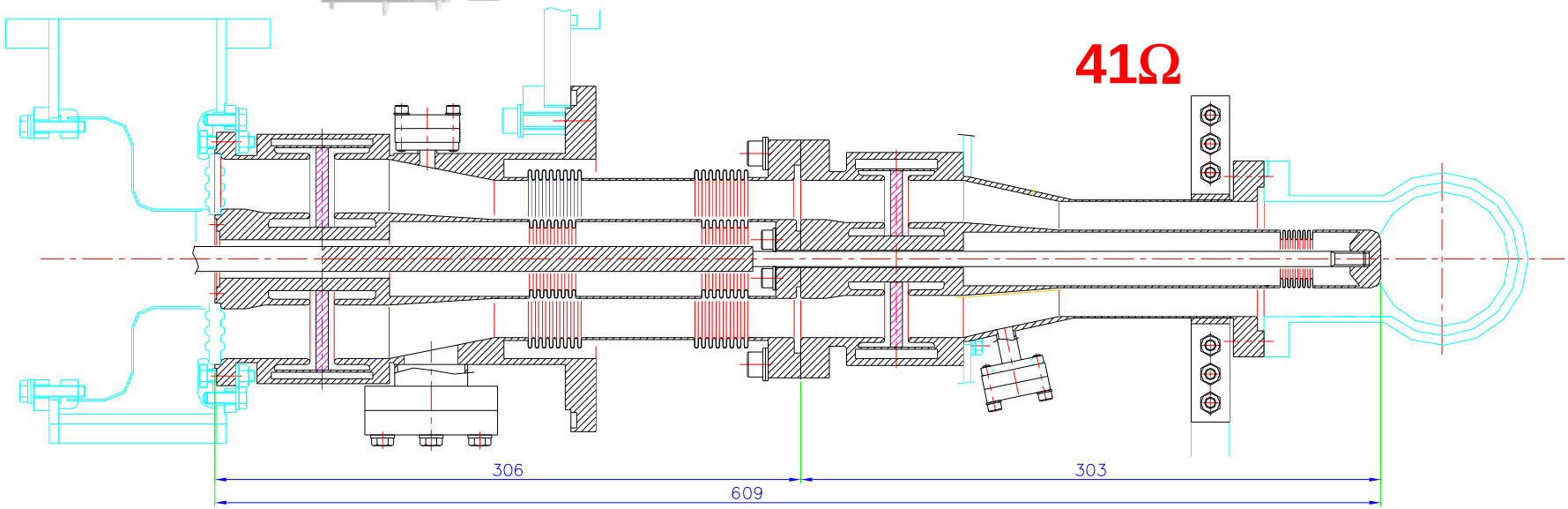
	TESLA(BCD)	STF-BL	Others
Vac. Seal	Al Hexagon	Helicoflex	
Input Coupler Port Size	TTF-III ϕ 40mm	Tristan Type ϕ 60mm	TTF-V,TW60 ϕ 60mm
He Jacket	NbTi - Ti	Ti	SUS
Tuner		Slide Jack	Saclay-II Blade
Mag. Shield	Outside of Jacket	Inside	
Tuner Motor	Inside of Vessel	Outside	
Piezo	Not Accessible	Replaceable	
5k Shield	Yes	No	

Main Coupler (Cold) Comparison

		TESLA500	TESLA800	LAL-Orsay	STF	
		TTF-3	TTF-5	TW-60	STF-BL	Capacitive
Tune ability		Yes		No	No / Yes	No
Port Diameter	mm	40	62	62	60	40
Position from cell	mm	45			58	55
Coax. Diameter	mm	40	62	62	60-->82	40-->72
Impedance	Ω	70	70	50	50 / 41.5	35-->24
Bellows		1	1	No	No / Yes	1
		Support for Heavy Connection Flange.		Easy Assembly		Heavy Flange
Window Type		Cylinder	Cylinder	Coax. Disk	Coax. Disk	Disk
Window Size	mm	ϕ40	ϕ62		ϕ92 / 22, t6.2	ϕ102, t3.6
2k Static Load	W				0.05	0.1
5k Static Load	W	0.5			0.6	1
5k Dynamic Load	W	0.3			0.2	2
						5k Load of 1 W costs ^2k Euro for 20 Years Operation.

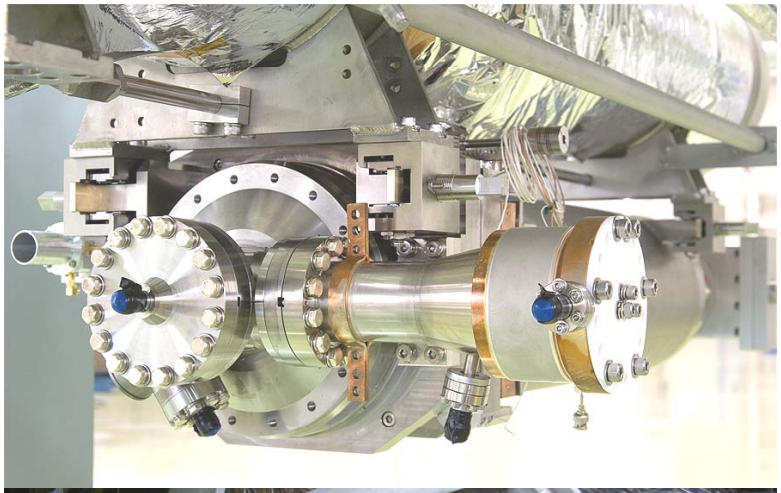
Warm Coupler						
		TTF-3	TTF-5	TW-60	STF-BL	Capacitive
Coax. Diameter	mm	62	62	62	82-->104	72
Impedance	Ω	50	50	50	50	24
Bellows		1	1	1	2	1
Window Type		Cylinder	Cylinder	Coax. Disk	Coax. Disk	Cylinder
Window Size	mm	ϕ62	ϕ62		Φ116 / 30, t6.6	ϕ112, t4, h68
80k Static Load	W				3	1.2
80k Dynamic Load	W					
Processing						
		0.5MW / 1.4msec.			1.0MW / 1.5msec.	2MW / 1.5msec.
		1.0MW / 0.4msec.			1.4MW / 0.5msec.	
		(2MW / 1.4msec.)				
Experience		~50			4	4
Diagnostics	Electron	3			3	0
	Arc	1			1	1

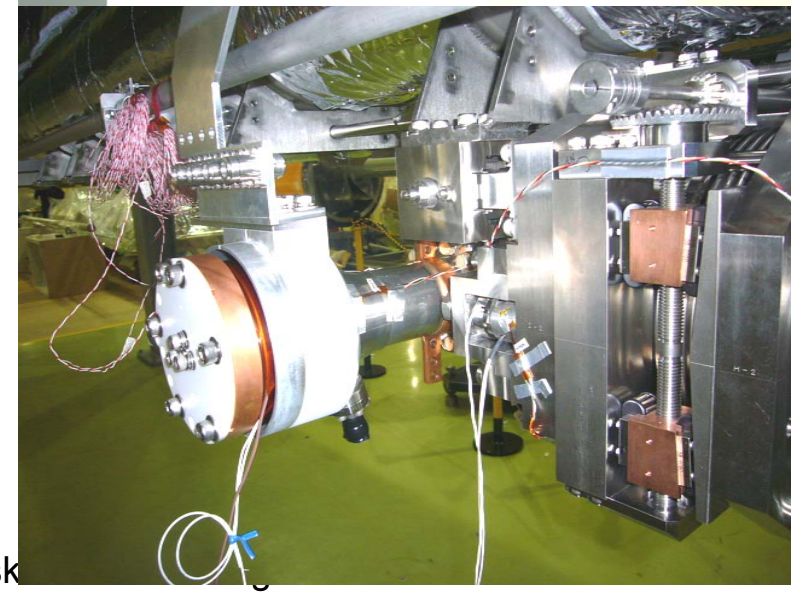

50Ω


41Ω
306
303
609

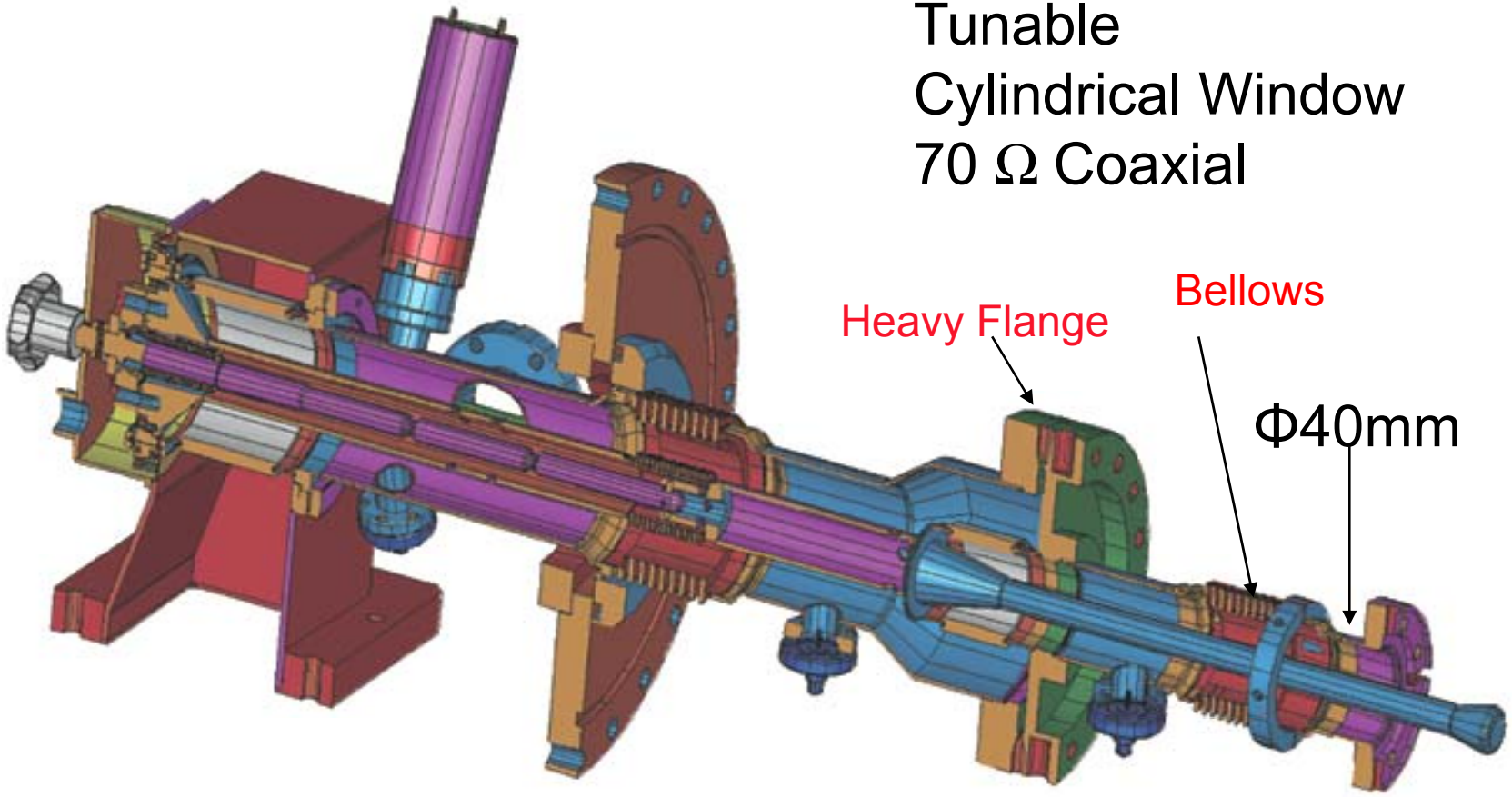
Cavity Assembly (#3 Cavity) ; Installation of Cold Coupler and Tuner

November, 2006'

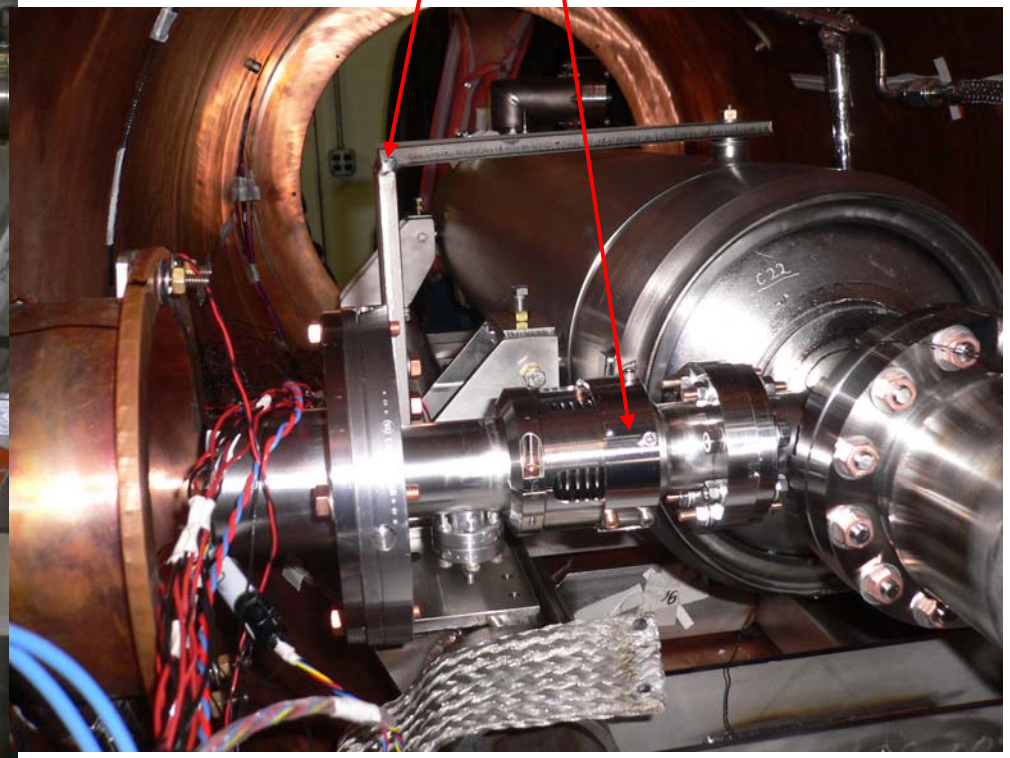




TTF-3 Coupler



TTF-3 Coupler



Undividable Sets of Components

- Flange (Cavity) + Seal + Input Coupler
- Jacket Cylinder (Tuner Flange) + Tuner
- Jacket Endplate + Magnetic Shield
- Piezo + Driver
- Motor + Driver

Levels of Compatibility

Level	Level 1	Level 2	Level 3
	Cryo-Module	Cryostat + Cavity Package	
Interface	Vacuum Vessel Flange Cooling Pipes Beam Pipe Wave-Guide Feedthroughs Motor Driver Piezo Driver	Vacuum Vessel Coupler Flange Cavity Hanging Arms from GRP Precooling Line 2k Pipe Inver Rod Thermal Anchor	