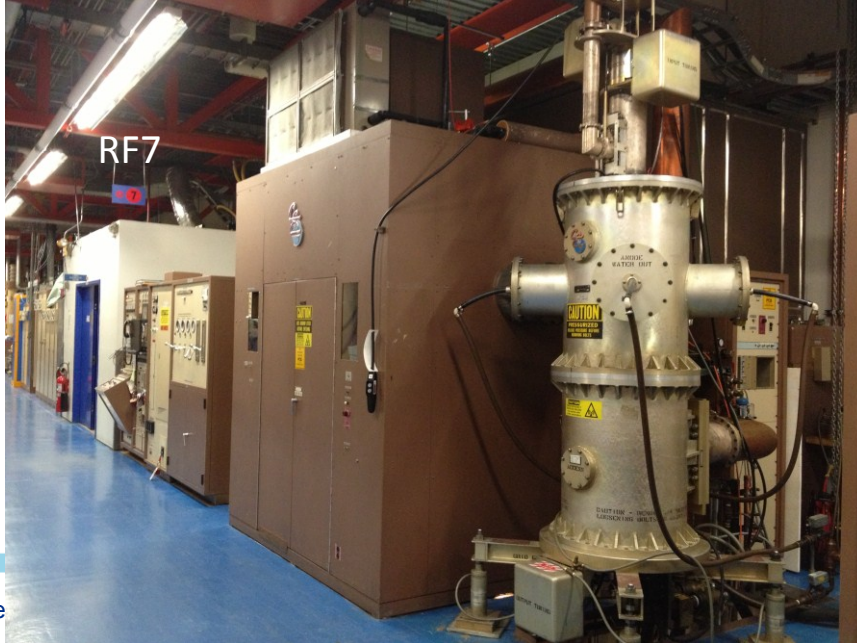
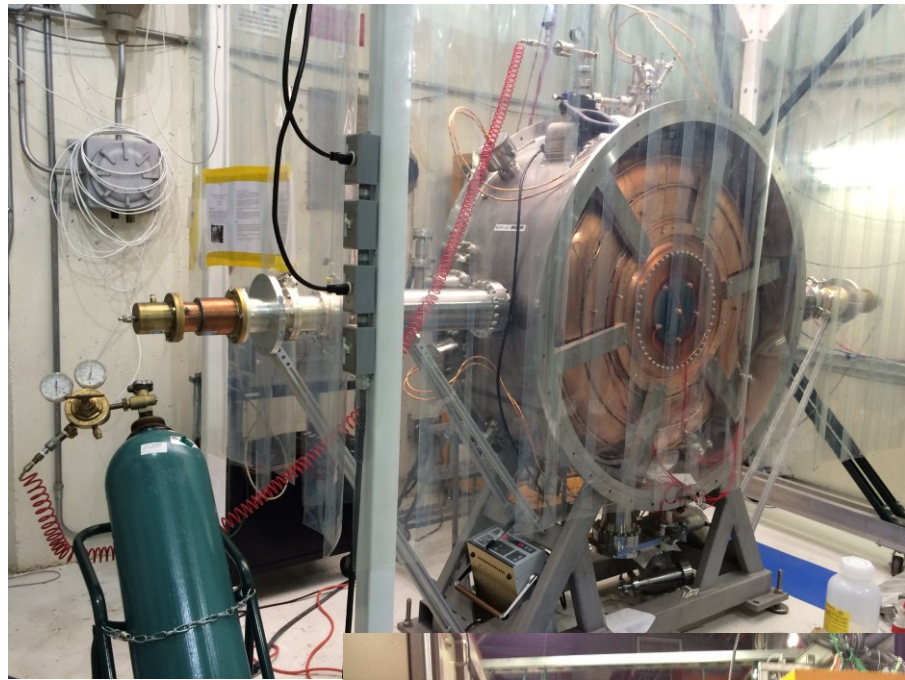
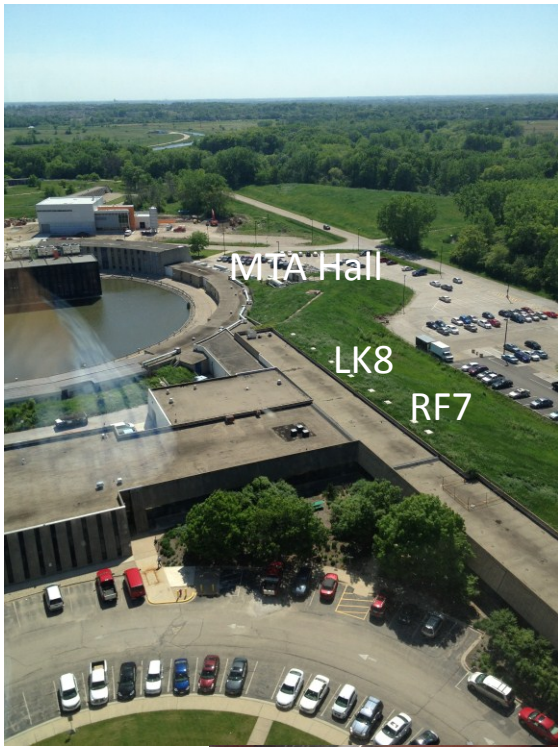


Instrumentation: MTA Setup

Moses Chung

MICE RF Workshop

June 2, 2014



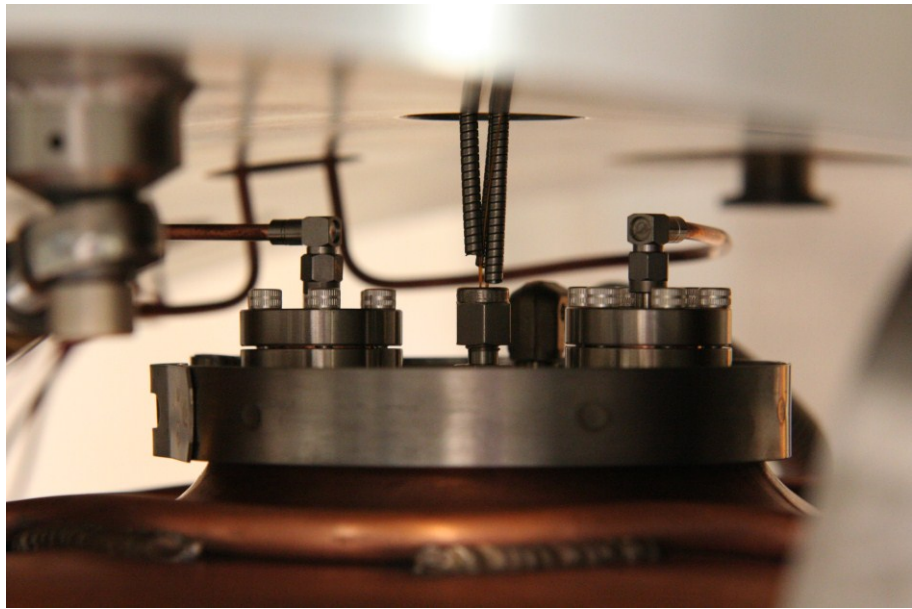
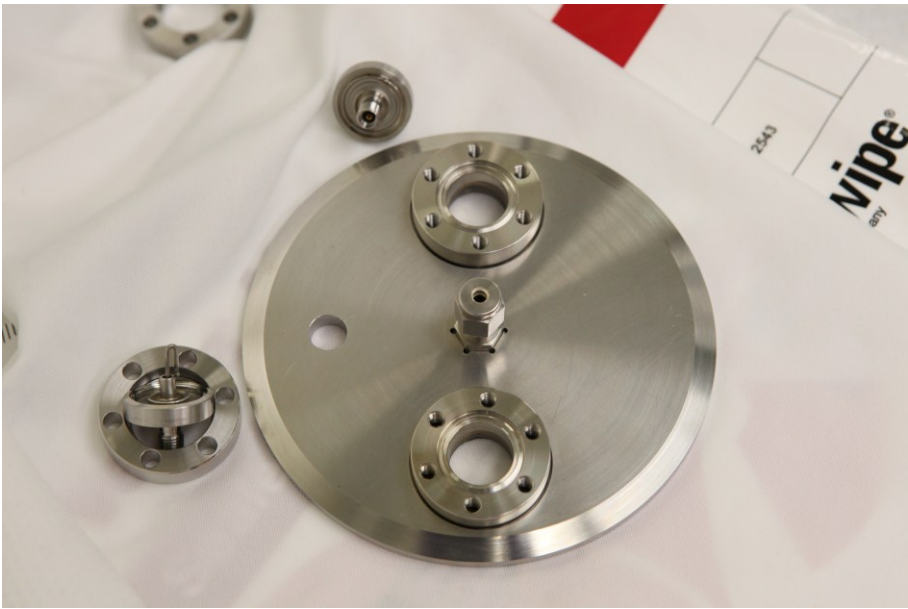


Challenges :

- should be controlled and monitored **remotely & systematically**
- should work consistently **in strong magnetic fields**
- should give **reliable engineering information and physics**

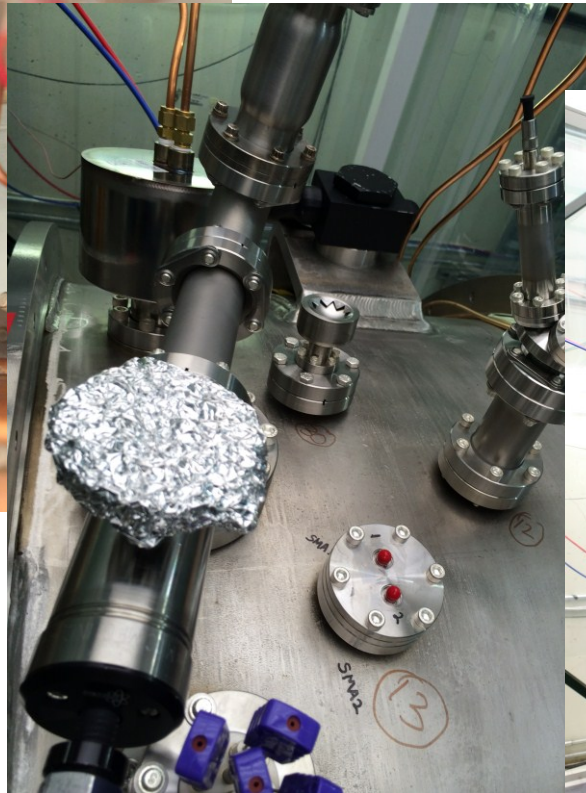
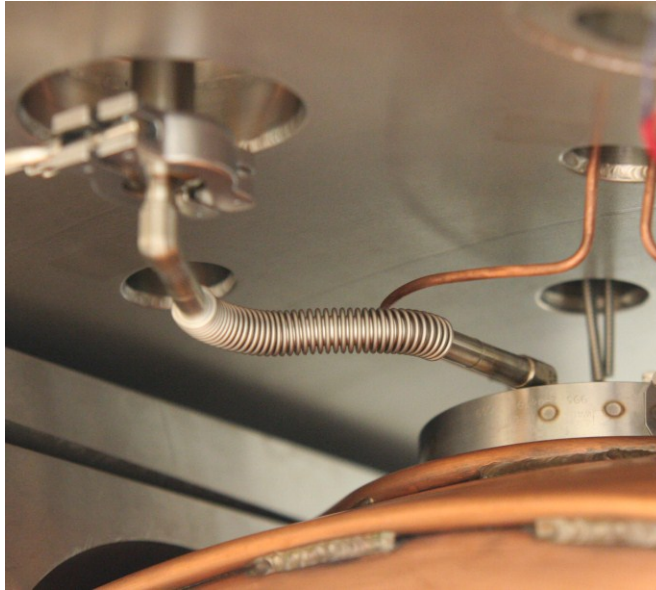
Location	Position	Source	Signal	Signal path	Readout	Status	Name
MTA Hall	Vacuum vessel	RF pickup x 2	cavity field	through top hat (internal cable TBD) heliac to patch panel near magnet heliac to rack LK8-7	LeCroy, LabView	Loops & f't in hand Top hat TBD	Al, Dave, Ralph
		cavity	vacuum	through top hat ? within hall (to sw rack?)	Local?	Hardware TBD	Al, Yagmur, Ryan
		vessel	vacuum	? within hall (to sw rack?)	Local?	Hardware TBD	Ryan
		cavity	breakdown light	fiber f't to detectors within hall (sw rack) heliac to rack LK8-5?	scope, LabView	Hardware TBD	Moses, Yagmur
		microphones (cavity body)	sound	STP in hall?	NI chassis (eth)	Prototypes in hand External cable TBD	Peter, Pavel, Dave
		thermocouples (cavity body)	temperature	feedthrough, to sw rack?	PLC	TC and f't in hand	Dave
		IR sensors (window/body)	temperature	port/feedthrough, to sw rack?	PLC	sensors in hand mech i/f TBD	Dave, Yagmur, Ryan
		Faraday cup	dark current	on-axis port heliac to pp heliac to LK8	scope?	Hardware in hand (to be modified)	Al, Yagmur, Daniel
		pots on forks (temporary)	tuner gap	local	local PC	Ready	Luca, Dave
	Couplers	DC on coax	coupler fwd/ref power x 2	heliac through pp next to magnet heliac to rack LK8-7	scope, LabView	DC in hand calibrated	Ralph
		viewports	light	fiber to PMT in hall? heliac to LK8	PeterP box?	Viewports in hand Interface TBD	Yagmur, Moses
		gauges	vacuum	? within hall (sw rack?)	local?	Hardware TBD	Ryan
		electron pickups	e current	RG58 for bias? heliac to pp heliac to LK8	scope, LabView	Pickups in hand	Yagmur
	Nearby in hall (outside B field)		actuator control	multiconductor cable to PLC	LabView	Ready, need cable	Luca, Dave
		gauges	air pressure	local cable to PLC	LabView	Hardware in hand	Dave, Luca
		gauges	water press/temp/flow	local?	PLC?	Hardware TBD	Dave
		gauge	coax SF6 pressure	local?	PLC?	Hardware TBD	Dave
	LK8	rack 7	envelope detector	RF pickup	RG58 to LabView		
		rack 7	envelope detector	ref pwr	RG58	LabView	Dave
		rack 8	patch panel	cavity light	RG58	LabView	
RF7	rack ?	DC on coax	fwd/ref power	heliac to LK8	scope	Cables in place? Dave	

Source	Signal	Signal path	Readout
RF pickup x 2	cavity field	through top hat (internal cable TBD) heliac to patch panel near magnet heliac to rack LK8-7	LeCroy, LabView

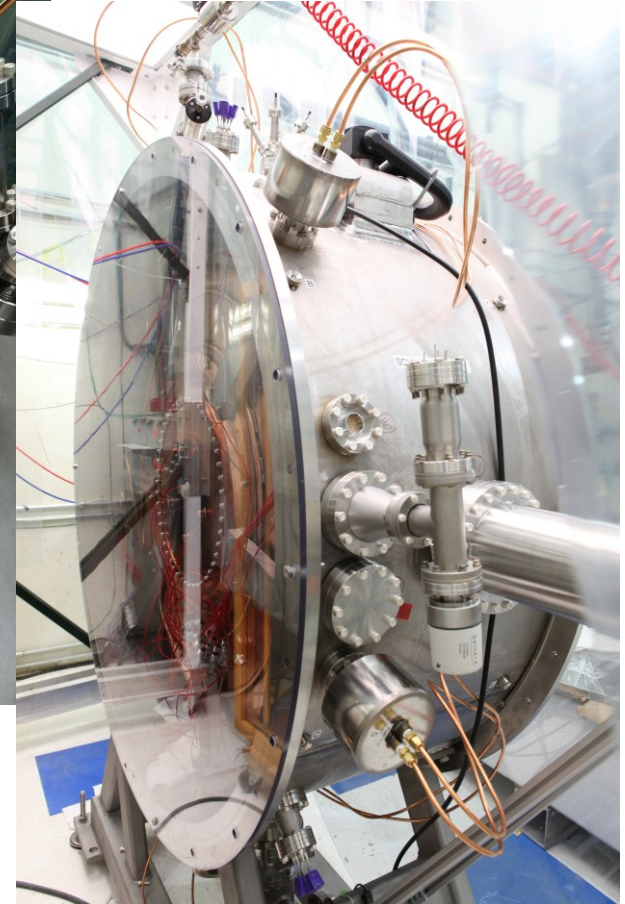


SMA

cavity	vacuum	through top hat ? within hall (to sw rack?)	Local?
vessel	vacuum	? within hall (to sw rack?)	Local?

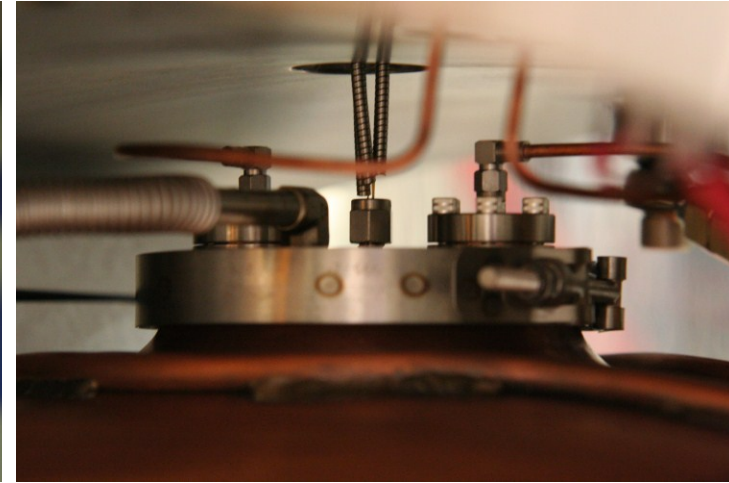
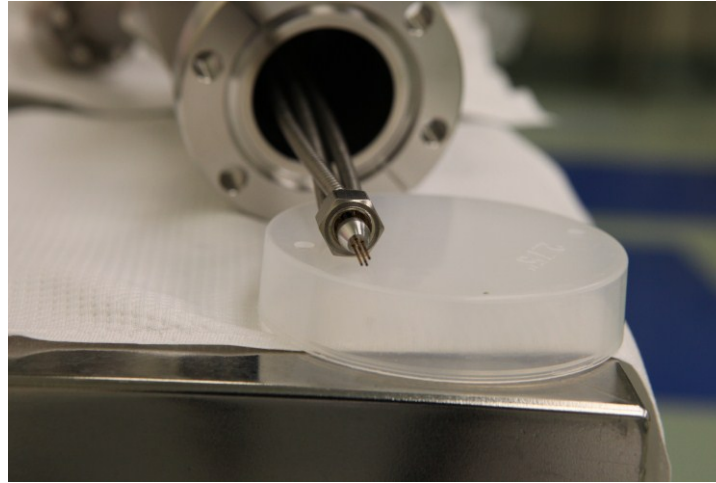


Vessel ion gauge



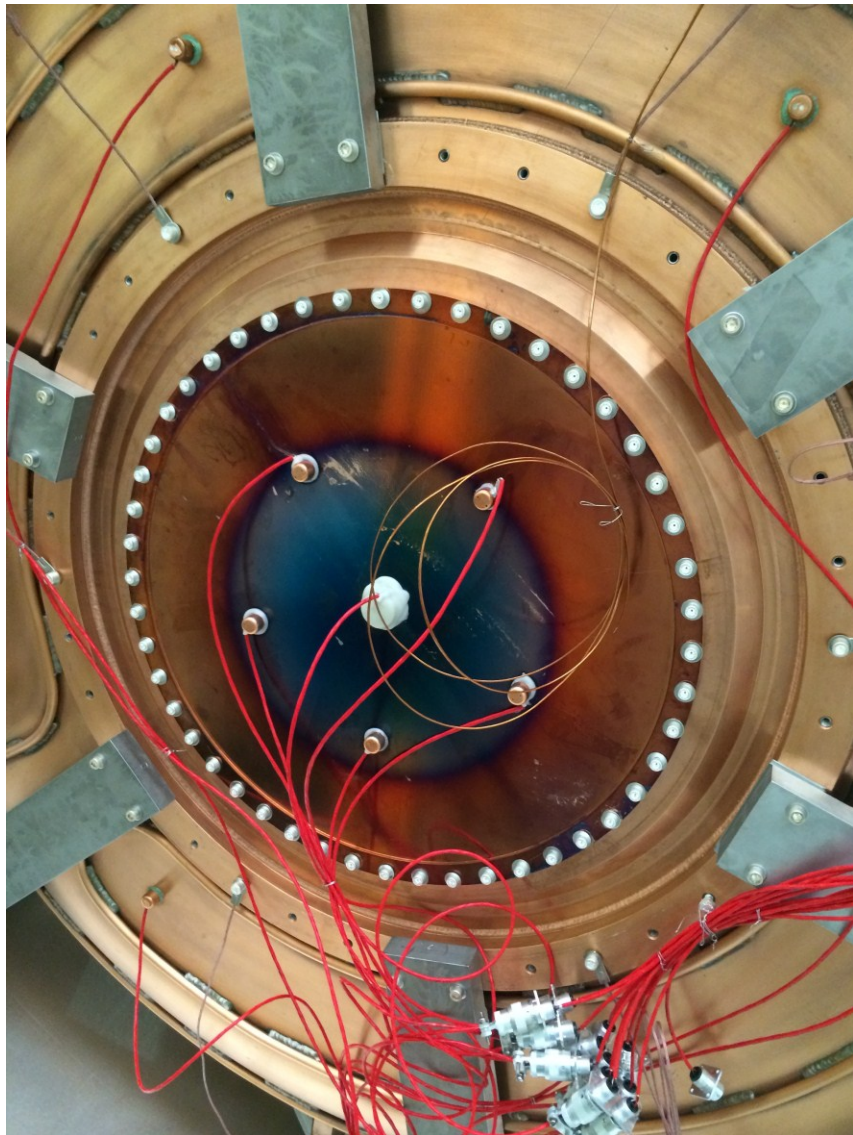
Cavity ion gauge

cavity	breakdown light	fiber f't to detectors within hall (sw rack) heliac to rack LK8-5?	scope, LabView
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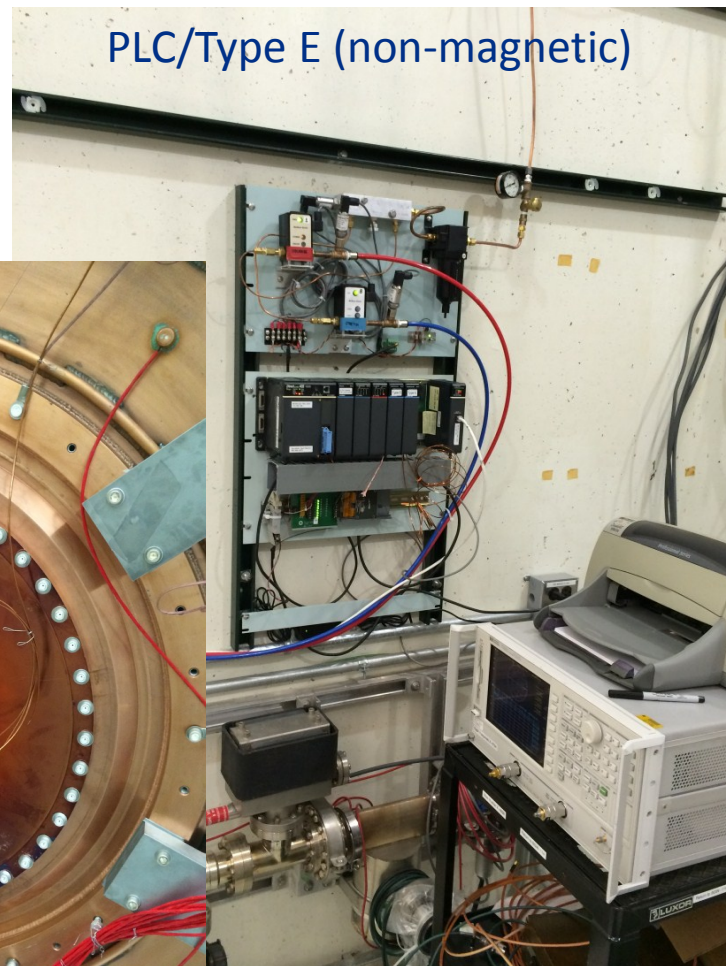
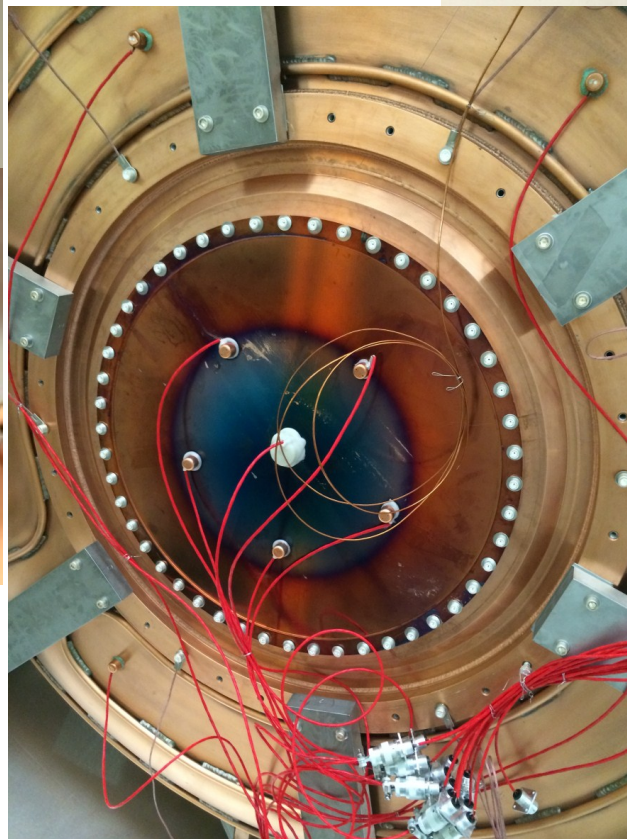


400 um
 NA = 0.22
 ~25 full angle

microphones (cavity body)	sound	STP in hall?	NI chassis (eth)
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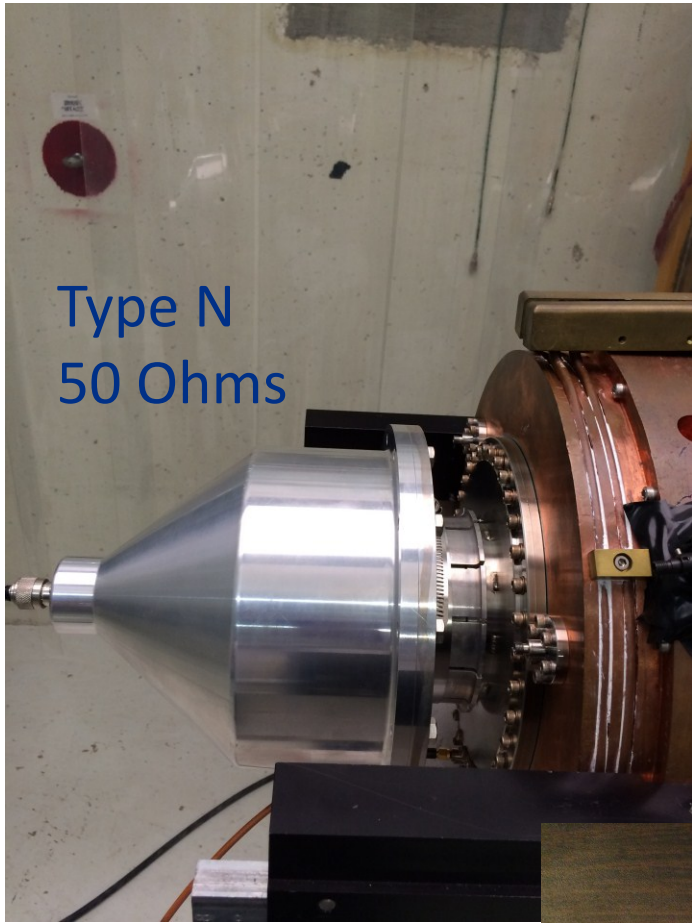
thermocouples (cavity body)	temperature	feedthrough, to sw rack?	PLC
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PLC/Type E (non-magnetic)

12 points
 → 4 x 3 feedthroughs

Faraday cup	dark current	on-axis port heliac to pp heliac to LK8	scope?
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Type N
50 Ohms

4-5/8"



Pre Amp (with DC power supply)
being considered

DC on coax

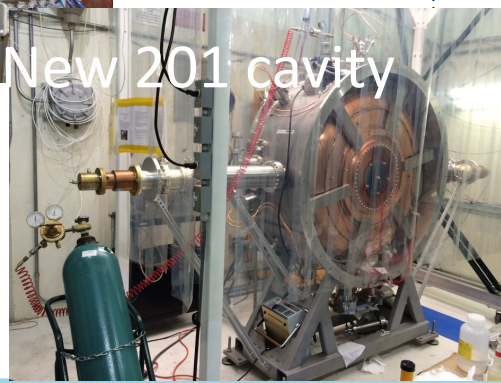
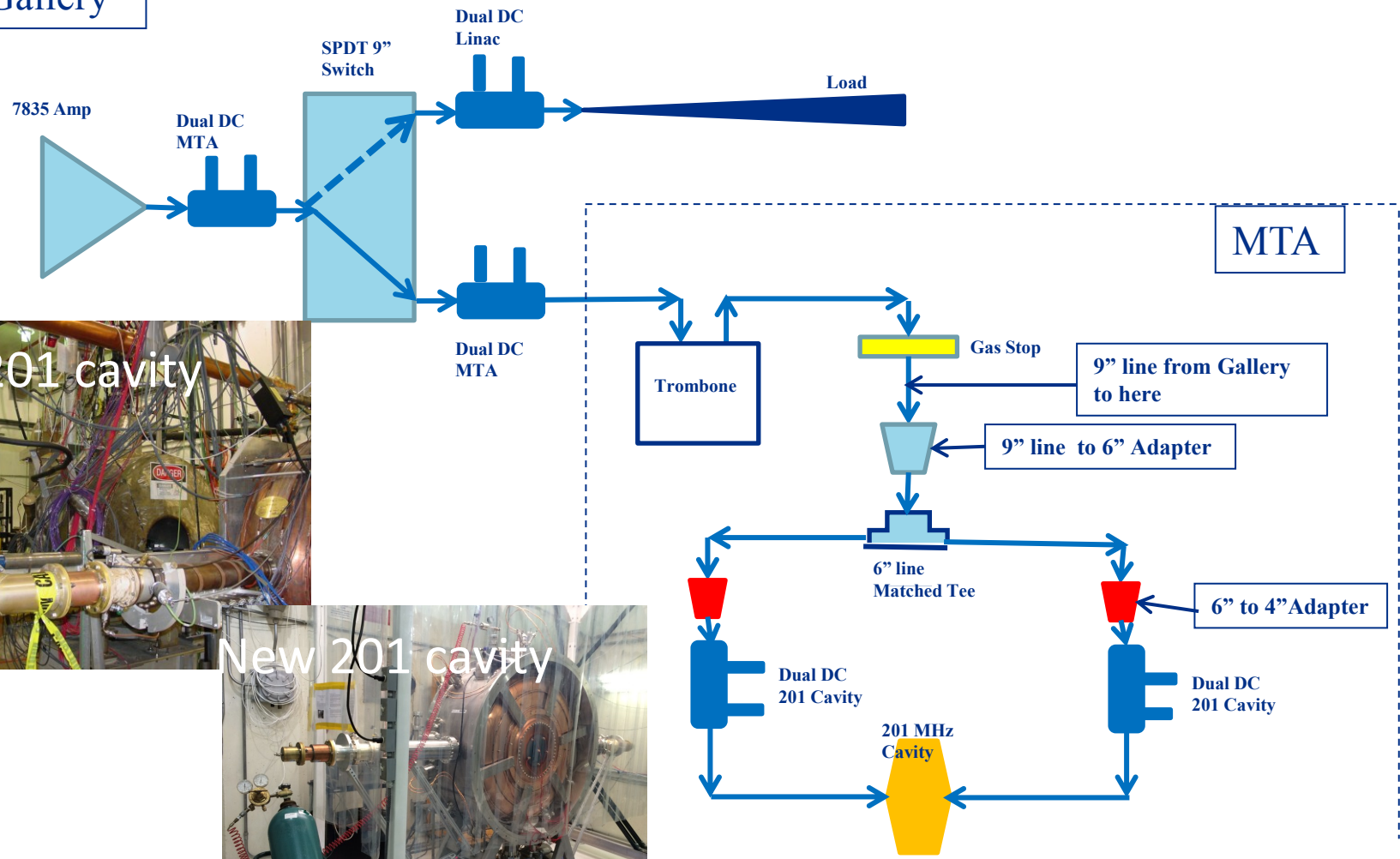
coupler fwd/ref power x 2

heliac through pp next to magnet
heliac to rack LK8-7

scope, LabView

Linac
Gallery

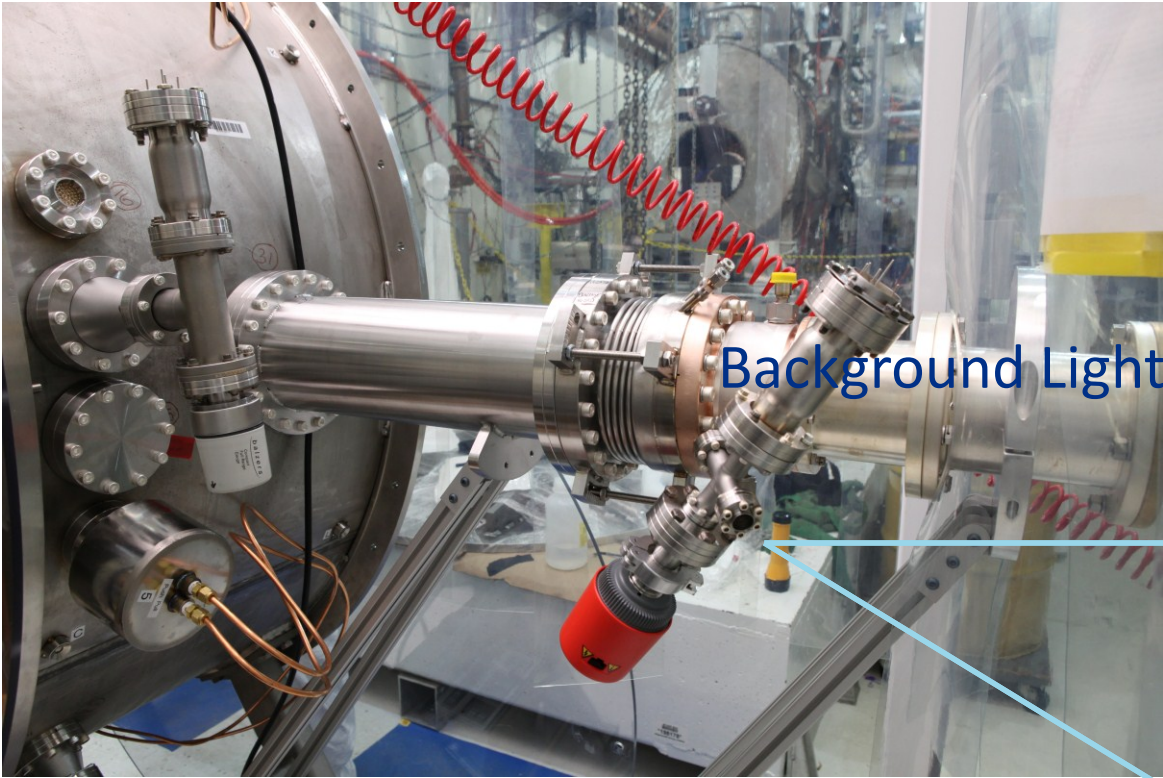
Al Moretti



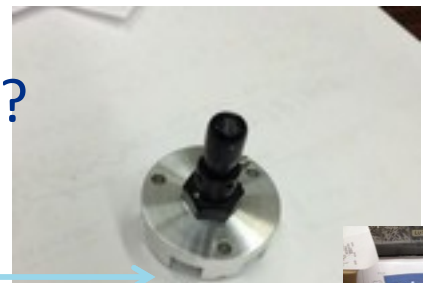
MTA

Couplers

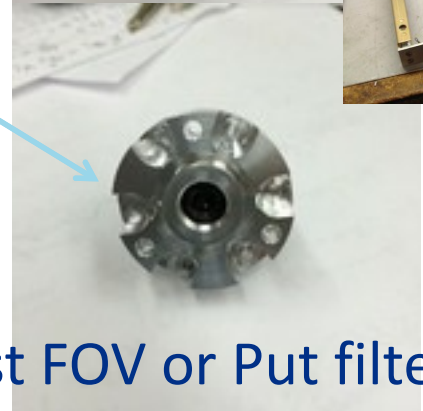
viewports	light	fiber to PMT in hall? helix to LK8	PeterP box?
gauges	vacuum	? within hall (sw rack?)	local?



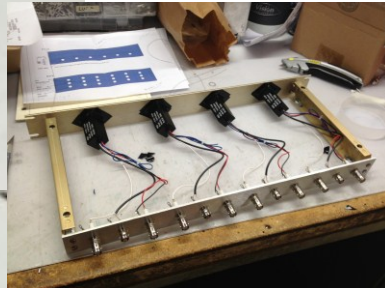
Background Light ?



0.78 ns
Rise time



Adjust FOV or Put filter ?



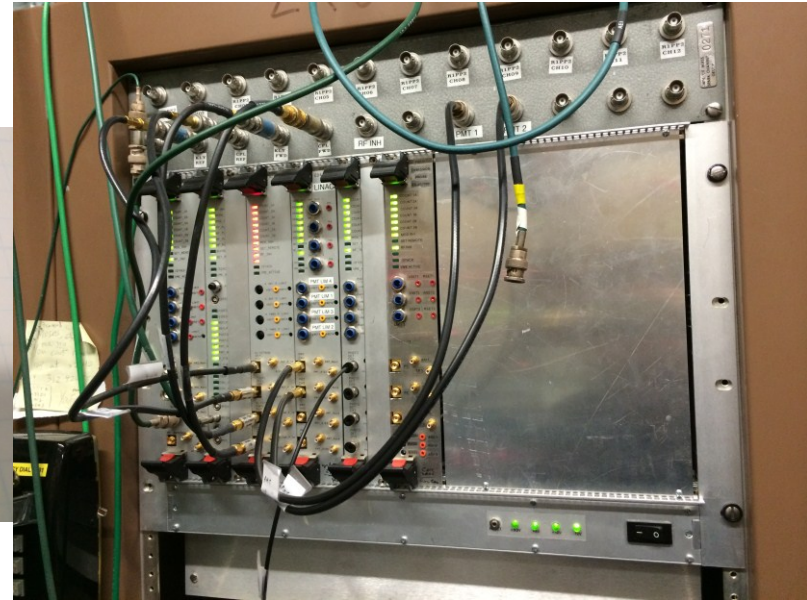
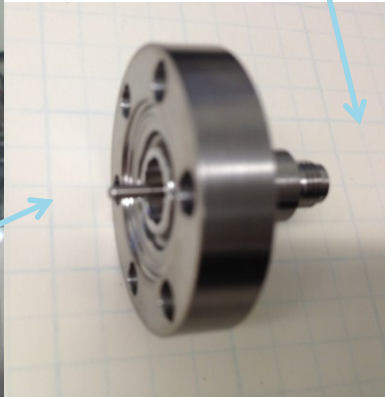
electron pickups | e current

RG58 for bias?
heliac to pp
heliac to LK8

scope, LabView

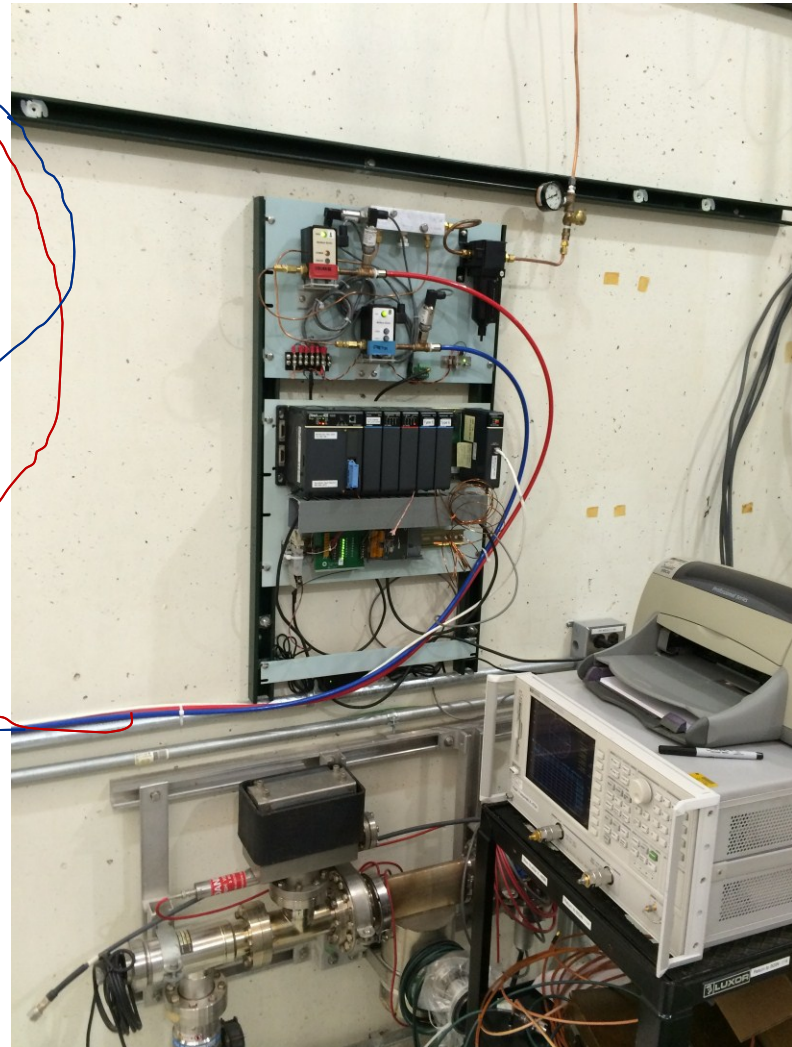
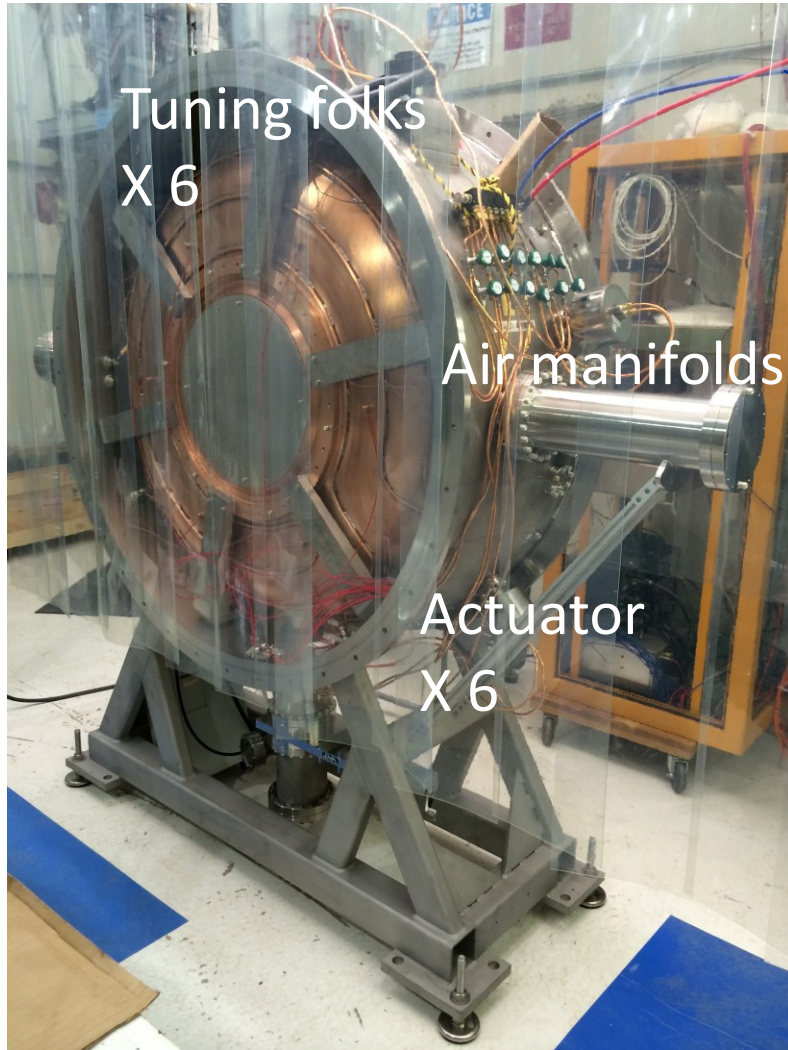


Signal delivered via Heliac



Electronics at VME crate
1 MHz BW → used for ASTA SCRF
20 V bias
3 Analog channels

Nearby in hall (outside)		actuator control	multiconductor cable to PLC	LabView
	gauges	air pressure	local cable to PLC	LabView



Inspection system: in progress (Daniel + Reidar)



Mirror-based



Mirror-less