KEK

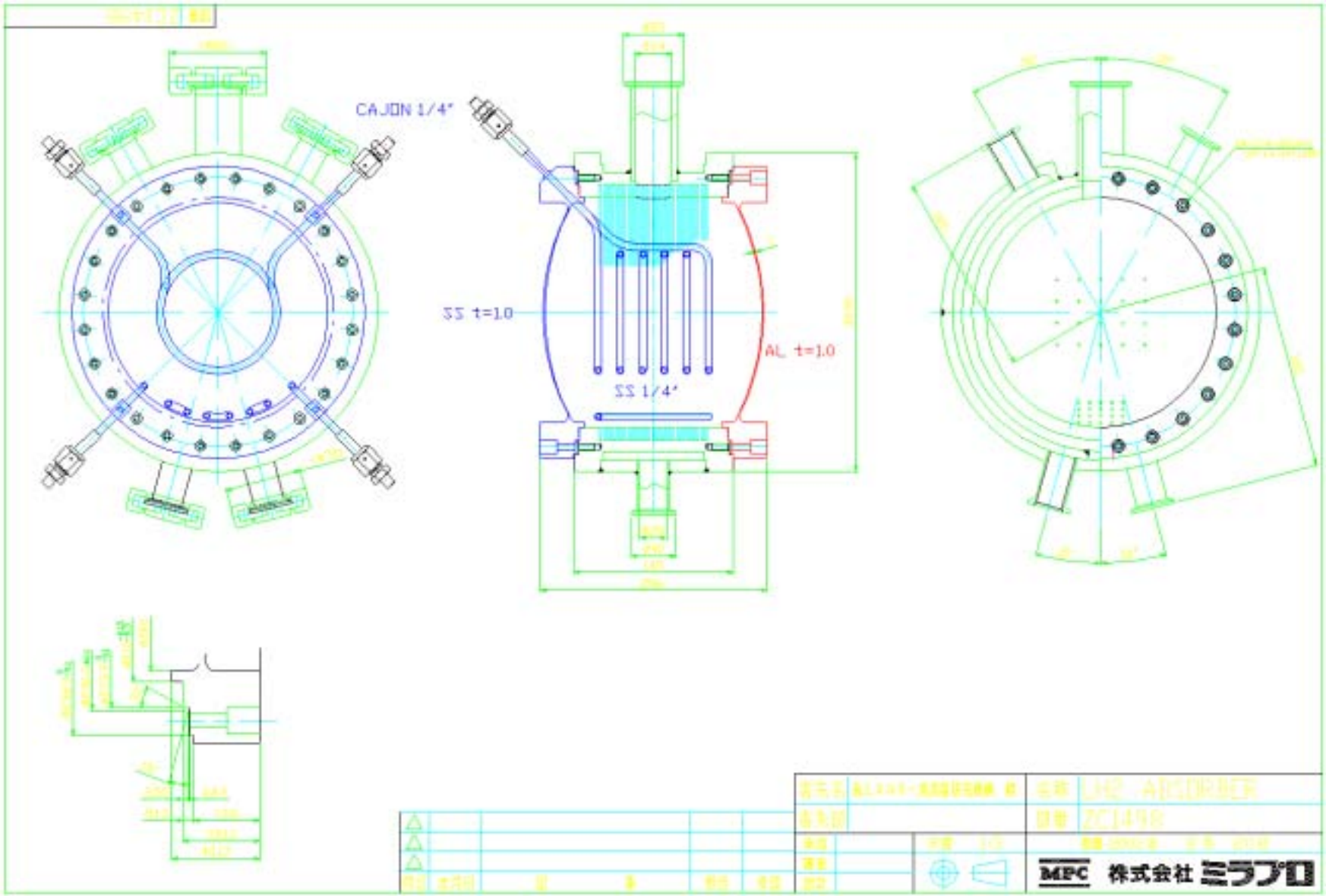
Present Status of KEK Absorber Test at MTA

Shigeru Ishimoto KEK

MICE/Mucool meeting, Jul-02, 2004 at FNAL

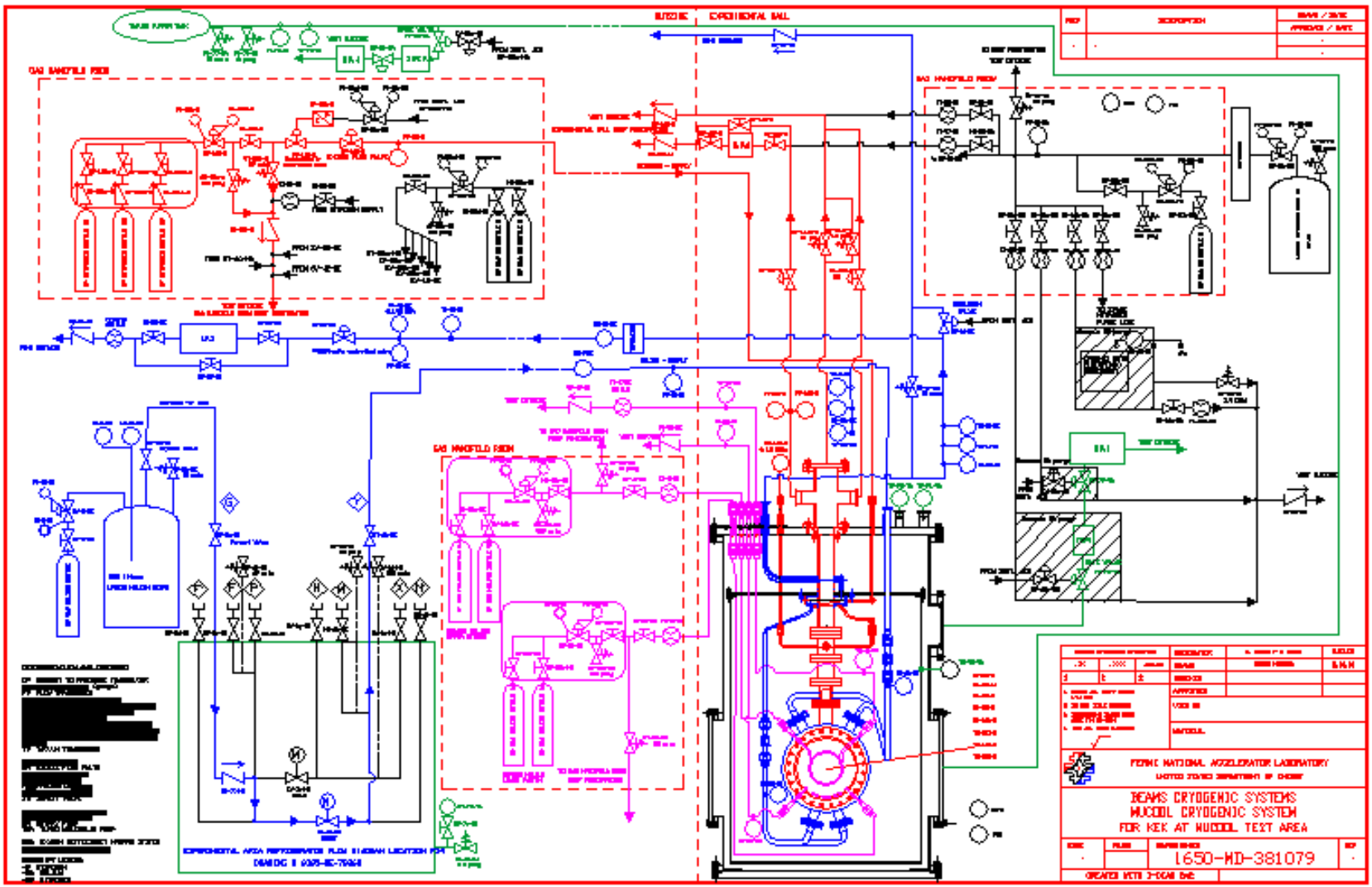
KEK

Absorber II



KEK

KEK Test Cryostat at MTA/FNAL



KEK

KEK Absorber at MTA

G-He Heater

KEK

KEK Absorber at MTA

KEK

KEK Absorber Test at MTA

KEK

KEK Absorber Test Record (Jun-20 ~ 26)

YY	MM	DD	W	T.abs	RECORD
2004	6	20	S	RT	<wait excess flow valve>
		21	M	RT	change the excess flow valve at H2 inlet line (needs more flow to supply H2)
		22	T	RT	**<approval of Division>**
		23	W	RT	**start operation procedure**
				RT	an electrical valve at H2-line leak in/out
		24	T	RT	the electrical valve was changed to a manual valve
		25	F	RT	a pressure gauge at H2-line was broken and changed
				RT	re-start operation procedure
				RT	needs 14 hours to change air to N2 in the electrical box
		26	S	RT	**G-H2 charge to the absorber (6:00-9:00)**

KEK

KEK Absorber Test Record (Jun-28 ~ Jul-01)

	28	M	RT	Map alarm system check for safety
	29	T	300K	**L-He cooling start**
			200K	C-He flow meter was broken and changed to mechanical one
			130K	T.T. heater was broken and change T.T. and heater
			88K	arrive at T_abs~80K
			70K	**LEAK 2/3 of 2,400 psig H2 from cylinder ?**
			90K	—> stop cooling and experiments
			90K	—> lost H2 was found in the cylinder
			100K	keep over night without cooling
			110K	open/reset DC1mA and needs 14 hours to change air to N2 in the electrical box
	30	W	125K	T_abs~125K, re-cooling start
			60K	**start temperature control test at ~60K**
			60K	—>need to set the heater and thermometer in short distance
			60K	—>need additional Dewar & T.T. to keep abs. cold
			80K	keep over night with 150W heater & 150 SCFH He-flow
7	1	T	68K	T_abs~68K
			100K	T.T. pulled out and dry up
			100K	—>remove valve orifice and sheet to get more flow
			100K	set T.T. at the reversal position
			100K	**set additional Dewar & T.T.**
			50K	start re-cooling
			22K	**arrive ~22 K with G-H2 NO LEAK**
			50K	keep overnight without cooling
	2	F	55K	re-start cooling

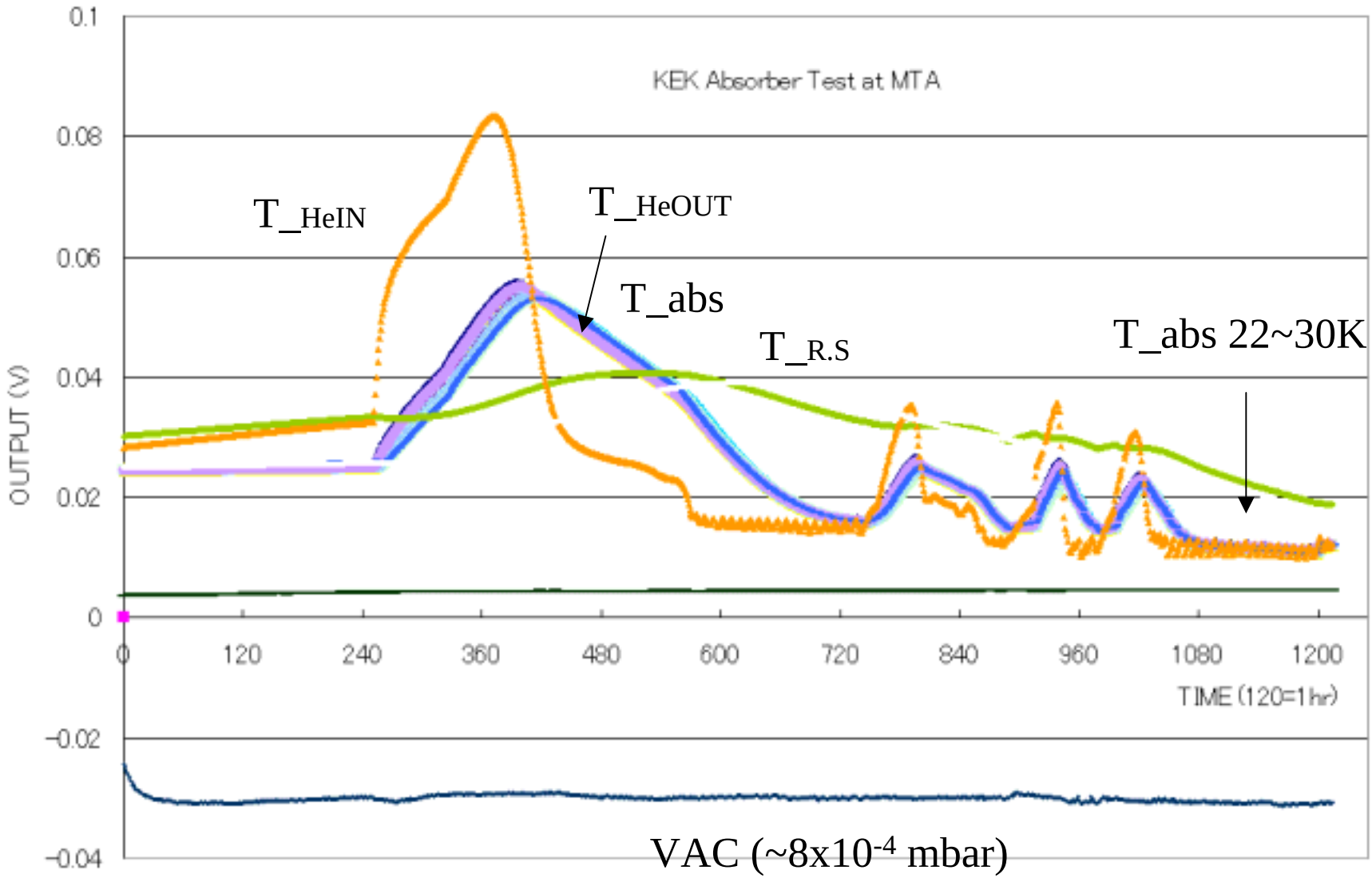
KEK

KEK Absorber Test Data (by KEK-PC) every 30s

TAG#	CH#	NAME	READ		CONVERT		comment
					(copy from FIT-2)		
TC-106-H	201	#1 PtCo in Abs.	10.6714303	mV	27.2314309	K	Abs. Top
TC-107-H	202	#2 PtCo in Abs.	10.6722107	mV	27.23543631	K	
TC-108-H	203	#3 PtCo in Abs.	10.6339203	mV	27.03796494	K	
TC-109-H	204	#4 PtCo in Abs.	10.6259389	mV	26.99655694	K	
TC-110-H	205	#5 PtCo in Abs.	10.6085204	mV	26.90588829	K	Abs. Bottom
TC-111-H	206	#6 PtCo in Abs.	10.6095951	mV	26.91149444	K	
TC-112-H	207	#7 PtCo in Abs.	10.6634144	mV	27.19024321	K	
TC-113-H	208	#8 PtCo in Abs.	10.6709292	mV	27.22885858	K	
TC-11-HE	209	PtCo C-He-OUT	10.660368	mV	27.17456797	K	
TC-72-VA	210	PtCo Rad.Shield	19.4737166	mV	56.53030129	K	
TC-12-HE	211	PtCo C-He-IN	10.7510993	mV	27.63632757	K	
VT-70-VA	213	MKS 0.1T	0.079030753	V	0.000790308	Torr	-0.11V offset
VT-71-VA	214	MKS 1000T	0.004574494	V	0.457449351	Torr	
TC-45-HE	215	PtCo WHeC-OUT	17.6063459	mV	51.38239585	K	G-He heater
TC-36-HE	216	PtCo WHeD-OUT	23.7487443	mV	67.76933793	K	G-He heater
FT-47-HE	218	100SLM, W-He-C	0.005772167	V	0.115443347	st.l/m	0-5V;0-100 st.l/m
FT-26-HE	219	200SLM, C-He	5.18251467	V	207.3005868	st.l/m	0-5V;0-200 st.l/m
*****	220	Type-T tc, R.T.	21.8448906	C	294.9848906	K	MTA area RT
PT-121-H	****	H2 Gas Press. MH	7.000	psig	0.48263299	barg	<<manual input
PT-116-H	****	H2 Gas Press. Abs.	3.000	psig	0.20684271	barg	<<manual input
W-He HEATER		R.T. W-He-IN	21.8448906	K	126.751907	J/g	input heat
		PtCo WHeC-OUT	51.38239585	K	280.3705644	J/g	output heat
		dJ	-29.53750525	K	-153.6186573	J/g	substract

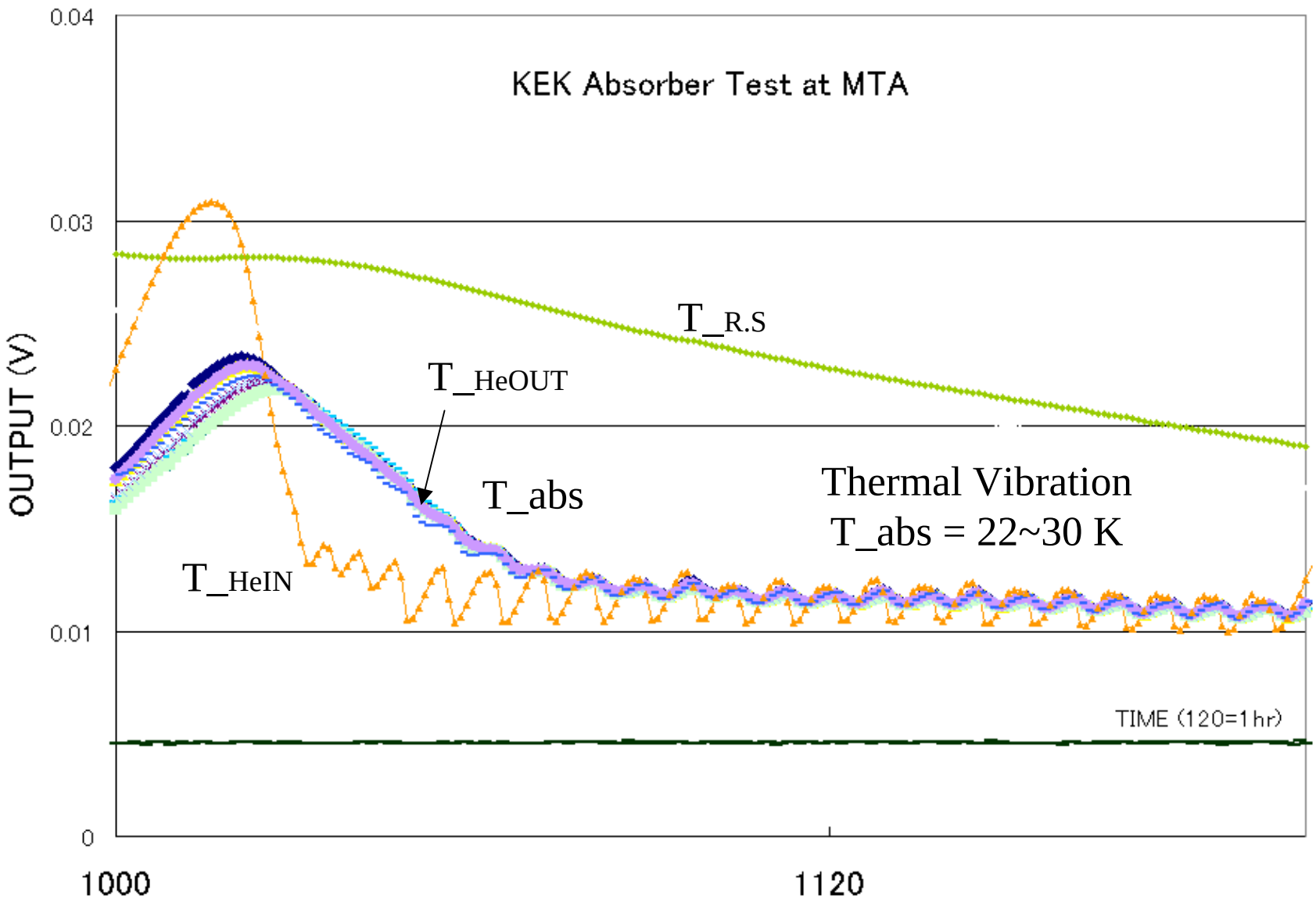
KEK

KEK Absorber Test Record (Jul-01)



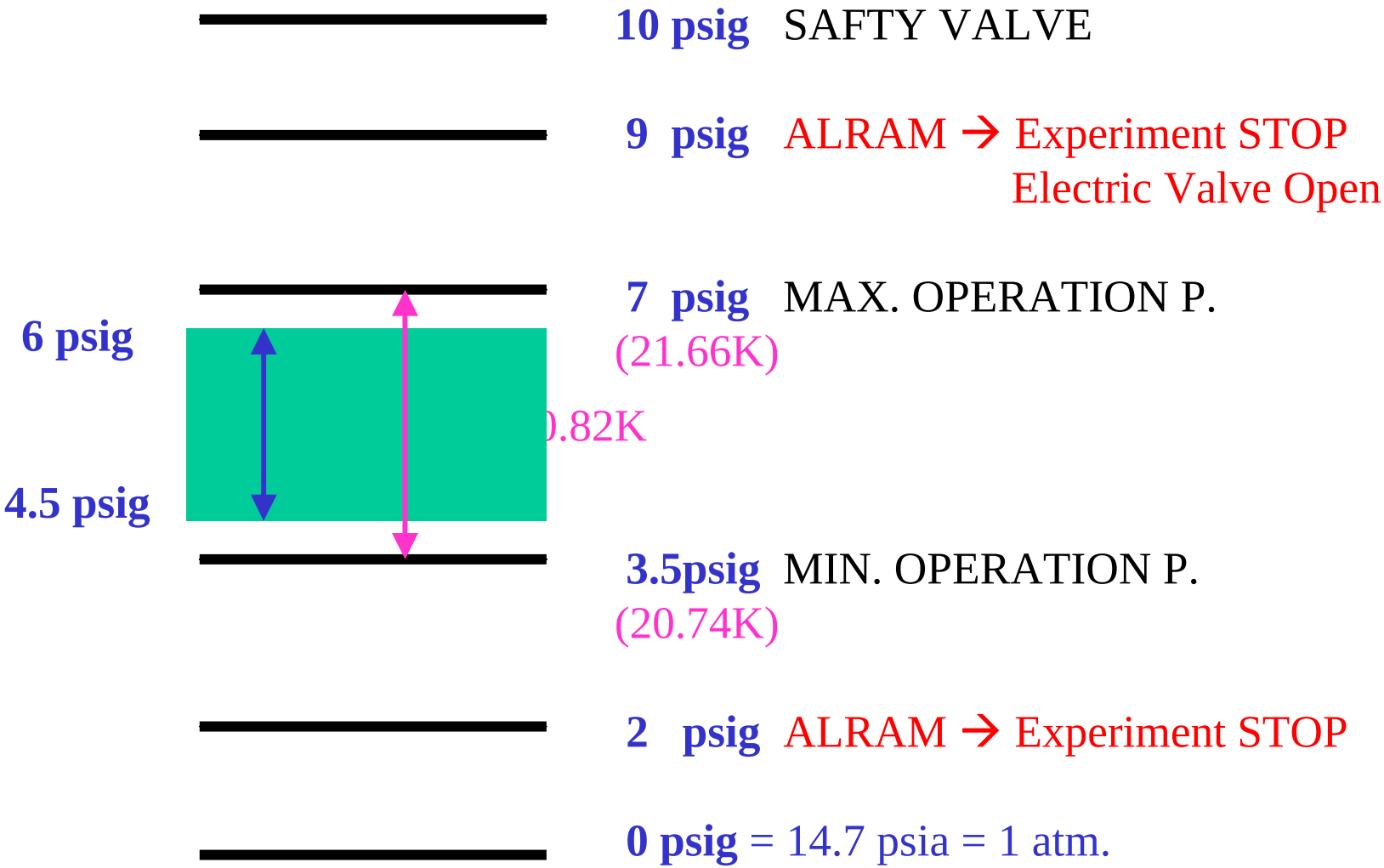
KEK

KEK Absorber Test Record (Jul-01)



KEK

LH2 Operation Condition at MTA



KEK

COOLING and TEST PROCESS of KEK CRYOSTAT

		SET T_in(C-He) = 17K	; 17, 15, 13, 11 …
		SET n(C-He) = 15 SLM	; 15 SLM shoul be define
		SET Q(W-He) = 0 W	
		SET P_H2 = 4.5 psig	; control n(C-He) up/down
		SET Q(W-He) = Q(W-He) + dQ W	; by Manual, dQ W should be define
		Timer 10 min.	; 10 min should be define
	all no	if n(C-He) > 100 SLM	; 100 or 180 SLM
		if 3.5 psig > P_H2 > 7.0 psig	
		if T_abs_min < 15 K	
		any yes	
		Timer 30 min.	; 30 min should be define
		DATA TAKING 1	
1st DAY	1	DATA(CenterH, T_in(C-He)=17K, n(C-He)=100 SLM)	; 3 hrs ?
	2	DATA(CenterH, T_in(C-He)=17K, n(C-He)=180 SLM)	; 3 hrs ?
2nd DAY	3	DATA(CenterH, T_in(C-He)=15K, n(C-He)=180 SLM)	; 3 hrs ?
	4	DATA(CenterH, T_in(C-He)=13K, n(C-He)=180 SLM)	; 3 hrs ?
	5	DATA(CenterH, T_in(C-He)=11K, n(C-He)=180 SLM)	; 3 hrs ?

KEK

Summary

1. L-He Cooling has been started.
2. Many initial problems and troubles were solved.
3. No cold leak of absorber at ~22 K with G-H2 inside.
4. Present challenging subject is the thermal vibration due to the L-He evaporation at the heater.

   → L-He Separator (next week?)

   → without heater/control by warm valve (today)

   → set heater in the L-He Dewar (today?)

5. The KEK absorber will be filled by L-H2 soon, and the cooling power test will be performed by the strong and friendly cryo-group members at FNAL.

Thanks