

GEC Instruments Model S10TC2TH, Serial GK01 Temperature Scanner

Instrument has 2 thermistor probes and 10 type T thermocouples, each 27' long with 24 gage stranded wire.

Resolution of thermistor readings:  $\pm 0.00025$  °C

Resolution of thermocouple readings:  $\pm 0.005$  °C

Test of accuracy and stability with TH1 thermistor probe and TC1 and TC5 thermocouple probes in gallium cell at 29.7646 °C

Test started 11-15-09

For testing, instrument was placed in an insulated box with 2" polyisocyanurate insulation in walls and bottom and 3" urethane foam at top.

Initial air temperature surrounding instrument inside insulated box was 23.2 °C

Air surrounding instrument was cooled to 4.4 °C, then later heated to 37 °C

TC3 is air temperature adjacent to instrument.

TC2 is surface temperature at top of instrument.

REF is thermocouple reference junction temperature internal to instrument.

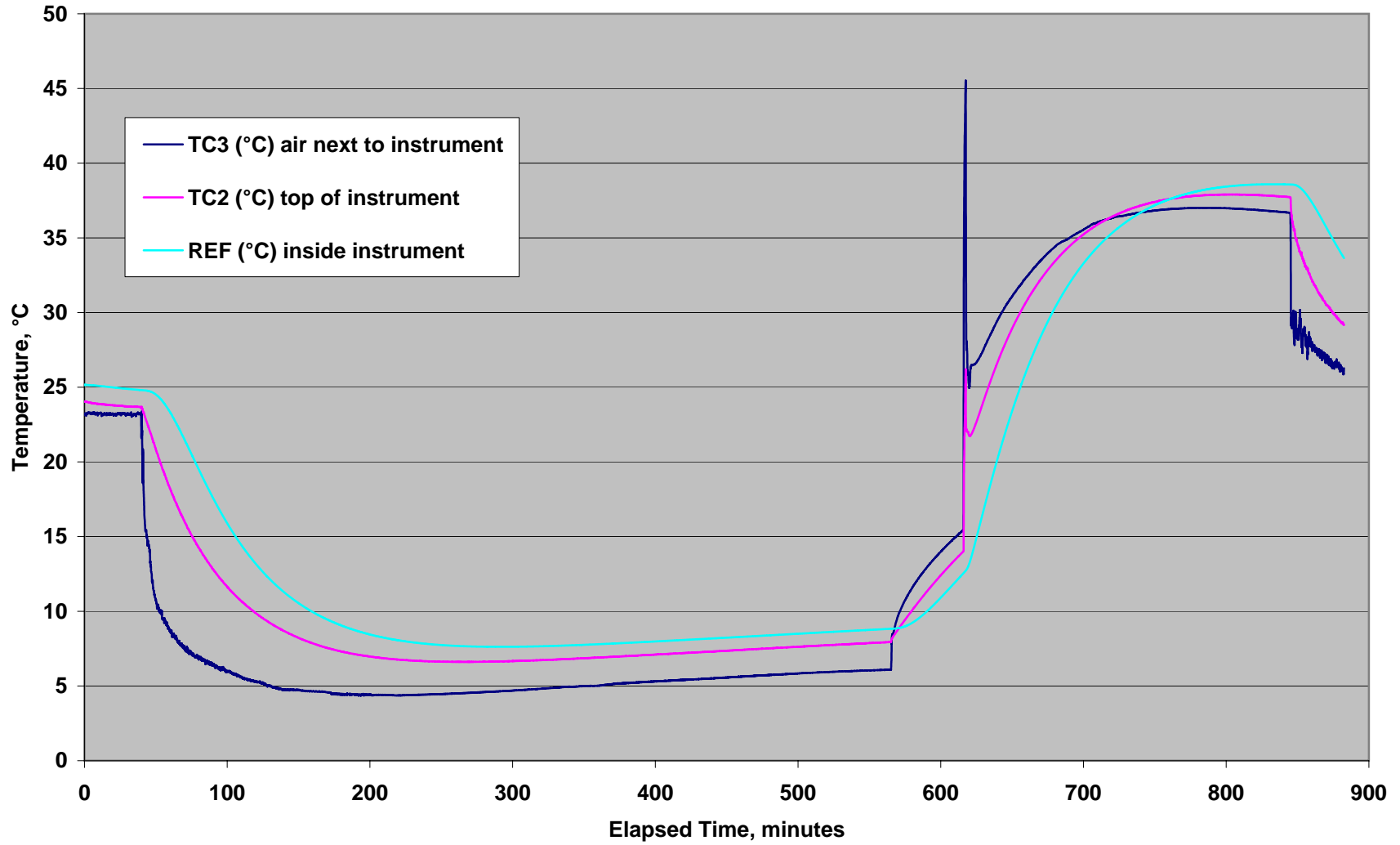
Test results are shown in plots on following pages.

Note small errors at temperature extremes after instrument temperature became fairly stable.

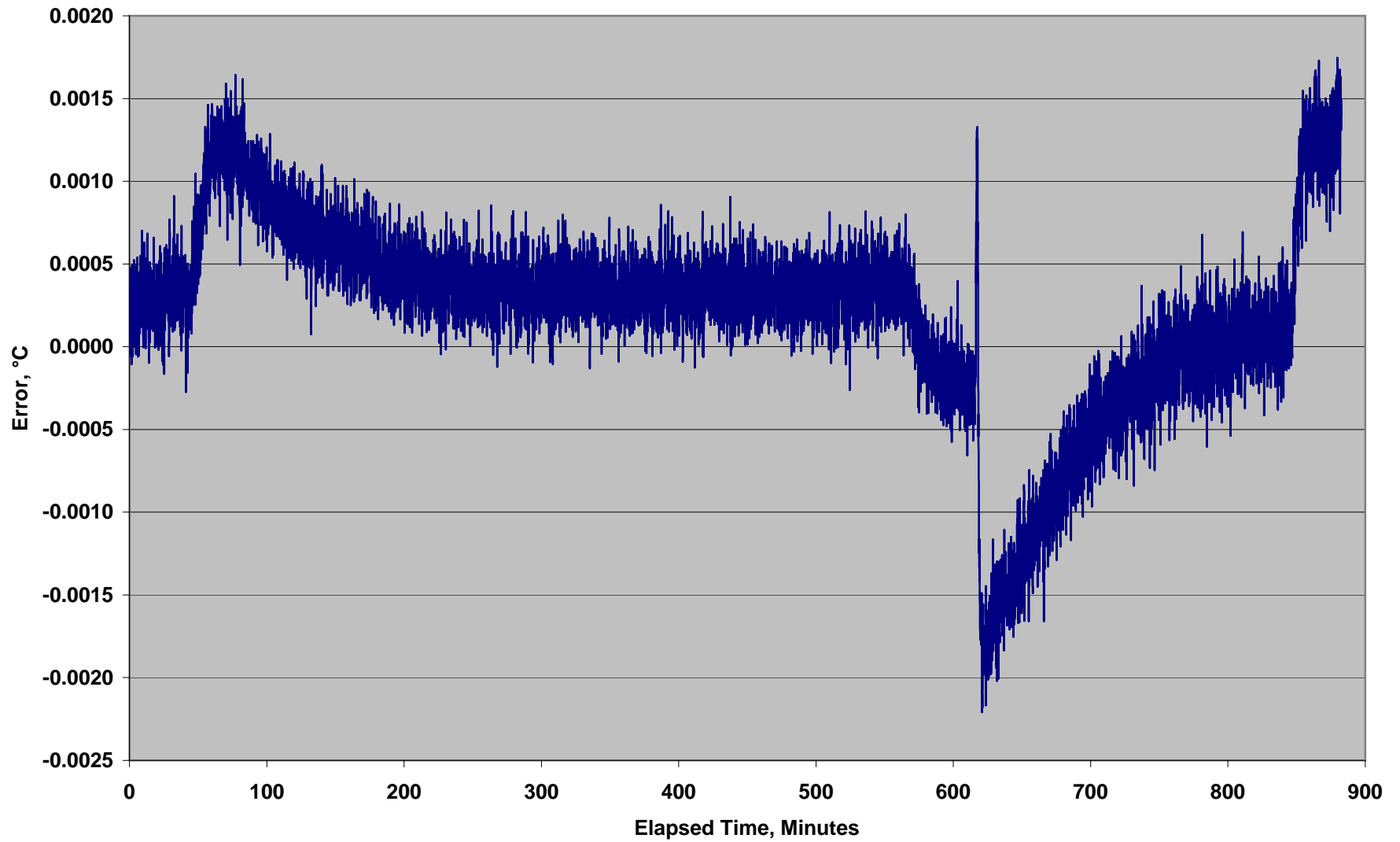
Note larger errors at transient temperatures when instrument is cooling or heating.

TIME	ELAPSED MINUTES	COOLING or HEATING EVENT
22:47:25	0.00	start log, insulated box is open
23:27:16	39.86	add blue ice for cooling
23:29:09	41.74	close insulated box
2:31:00	223.59	start "stable period" at cold temperature
8:11:05	563.68	open box, remove blue ice
9:03:26	616.01	start heat blower to add warm air to box
9:04:52	617.45	stop heat blower
9:08:11	620.76	add 1 gallon jug hot water - close box
11:42:26	775.01	box becoming stable at high temperature
12:52:13	844.80	open box - start cool down
13:29:58	882.56	end test - gallium is all melted

Air Temperature, Instrument Surface Temperature, Reference Junction Temperature



GK01 - Thermistor probe TH 1 in gallium cell 29.7646 °C



GK01 - Thermocouple Probe TC1 in gallium cell 29.7646 °C

