

Summary of RTCH5 Conditioning

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Status

As of 10/28/09, RTCH5 was fully conditioned to operate at 10.7 kW with a 3 ms pulse length at 2 Hz. This is slightly larger than 120% of the nominal 8.87 kW (power to be dissipated in the cavity). The cavity was operated at this level for a total of 5 hours.

Baking

- This cavity was not baked due to the fact that the alignment targets are epoxied on. The epoxy should have acceptable strength to 177 C. The nominal bake temperature is usually 150 C, but we were concerned about the fact that the heat tape would have been very close to the targets, and also because the bake may overshoot 150 C in certain areas.

Vacuum

- The base pressure was substantially higher than that for baked cavities. When we began conditioning the pressure was 6.3E-07, after three days of pumping with the turbo pump. Since the pressure was higher, we conditioned with both the turbo pump and the ion pump. As of 10/28, the pressure is 2.0E-07, with no RF power, and 4.1E-07 with full power.

Other Anomalies

- The alignment targets are epoxied onto the cavity

Details

- *10/26/09*: Started at low power, 100 us pulse width, 1 Hz and gradually increased power to 10 kW. Multipacting in the coupler was the main issue. The cavity was also conditioned for approximately 1 hour at 2.5 to 3 kw, 1ms, 1Hz. On this day the cavity was conditioned for a total of 5 hours.
- *10/27/09*: Conditioned to 10.7 kW (120% of nominal), 3ms, 2Hz. Gradually worked up to this average power and ran there for about an hour. The only issue was multipacting in the coupler, which continued to condition away steadily.
- *10/28/09*: Continued to condition at 10.7kW, 3ms, 2Hz. Conditioned for about 4 hours before the scheduled power outage. No more multipacting was visible in the coupler after about 2 hours of conditioning. No sparking was observed. We will skip the full eight hour run this time since 1.) The cavity operates well and 2.) We need to move on with RFQ conditioning and proceed with cave work. Plots for 10/28 are shown in Figure 1.
- Further details may be found at <http://www-hins-crl.fnal.gov/hins/Index.jsp>

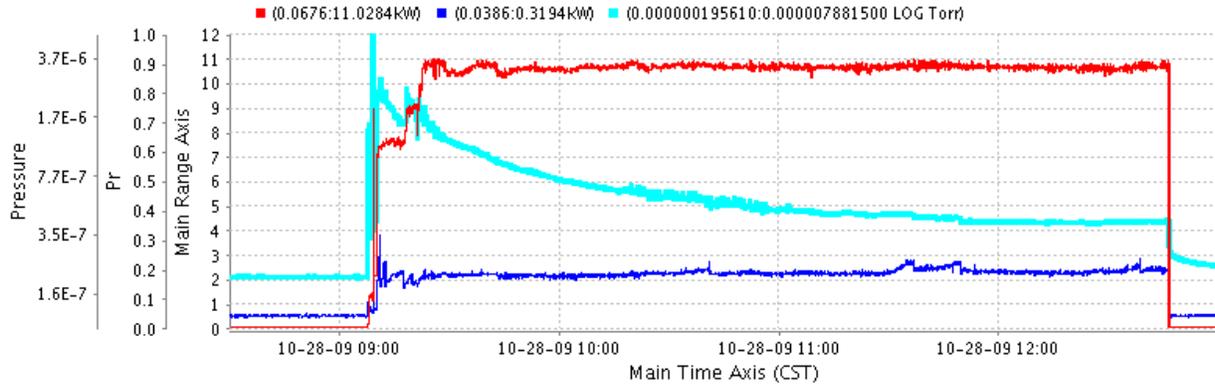


Figure 1: Forward and reverse power (red and blue), and pressure (cyan = ion gauge) during the final 4 hours of conditioning.