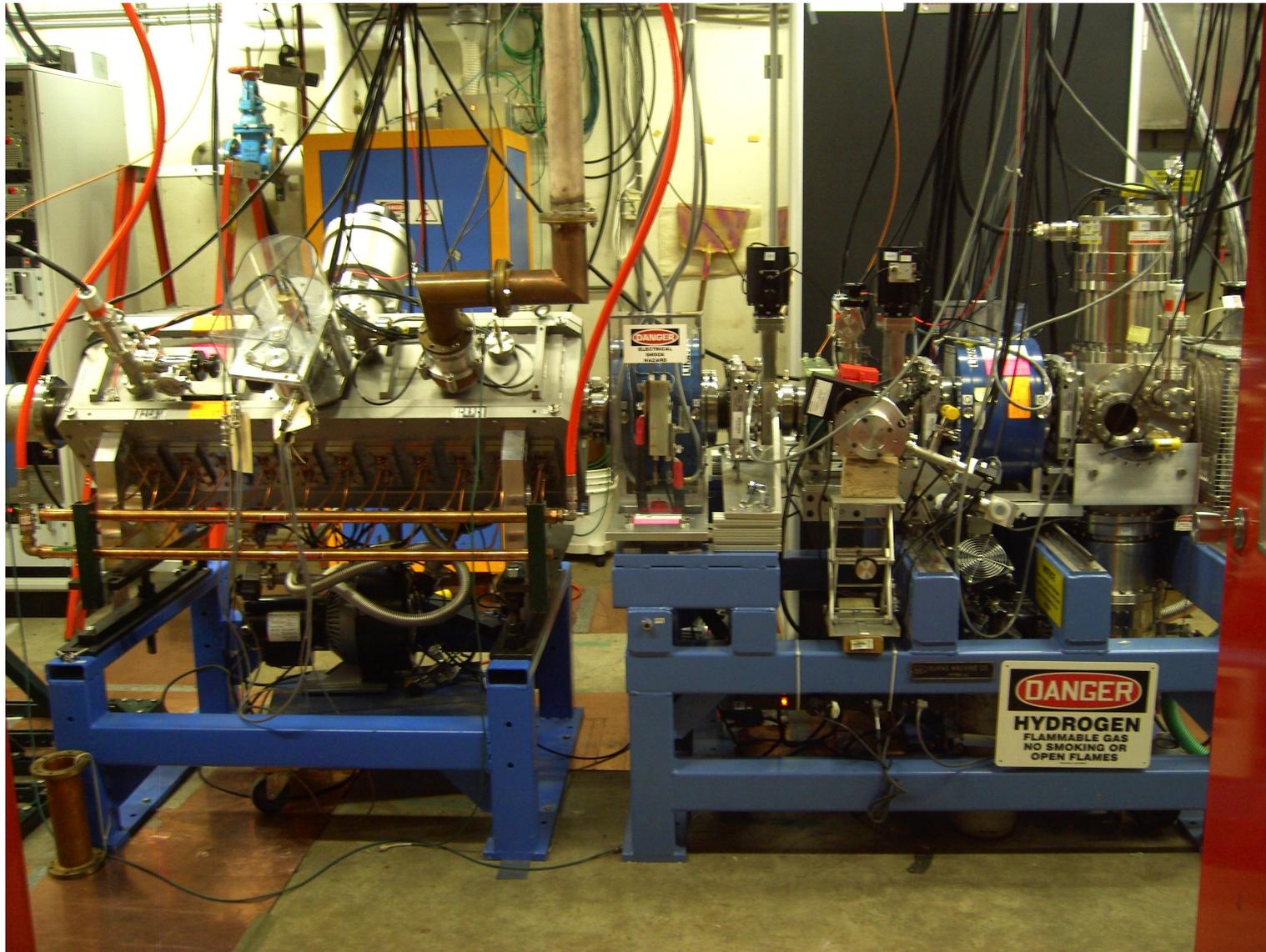


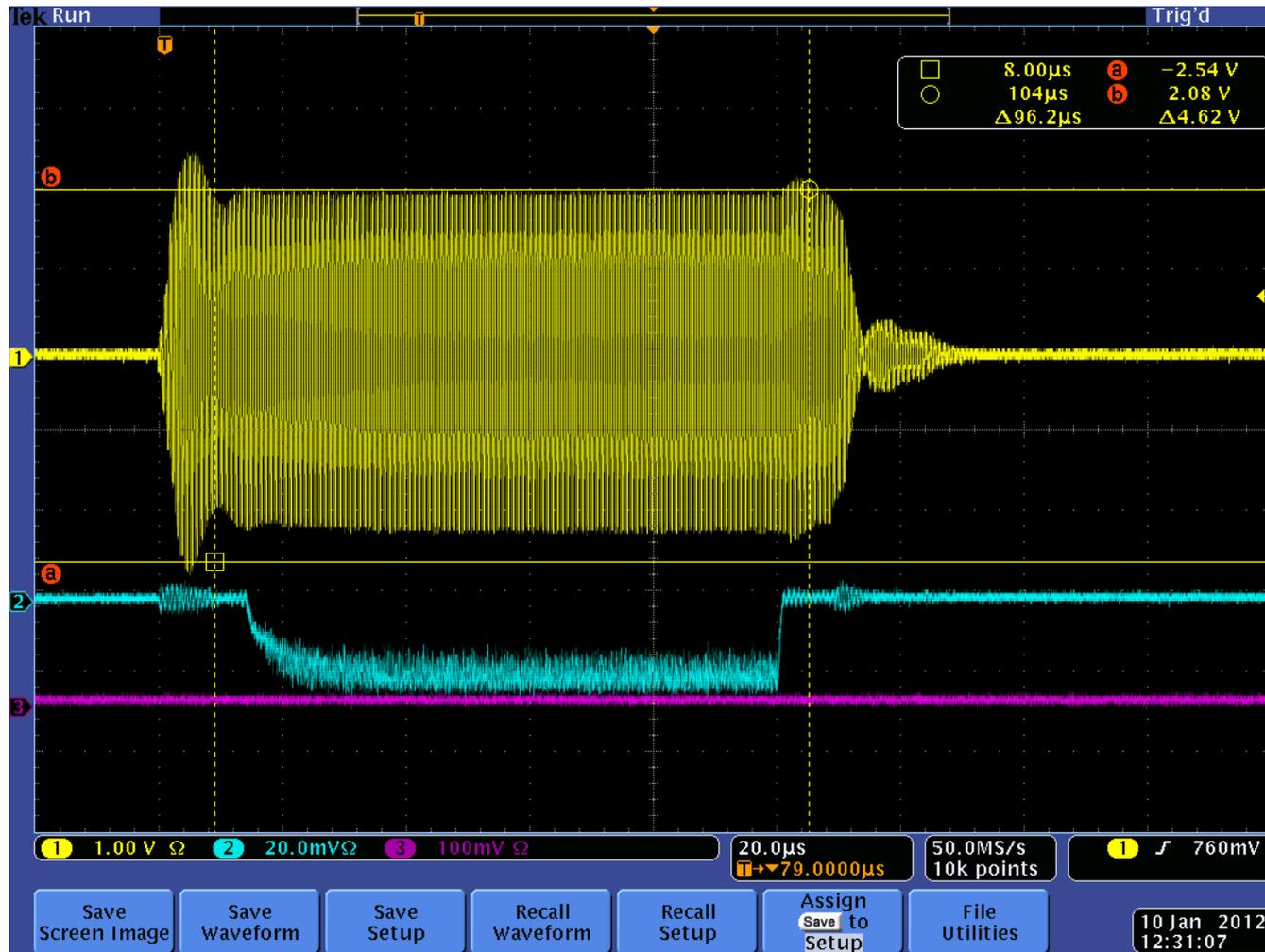
# RFQ Beam Measurements

C.Y. Tan, D. Bollinger, P. Karns, B. Schupbach  
18 Jan 2012

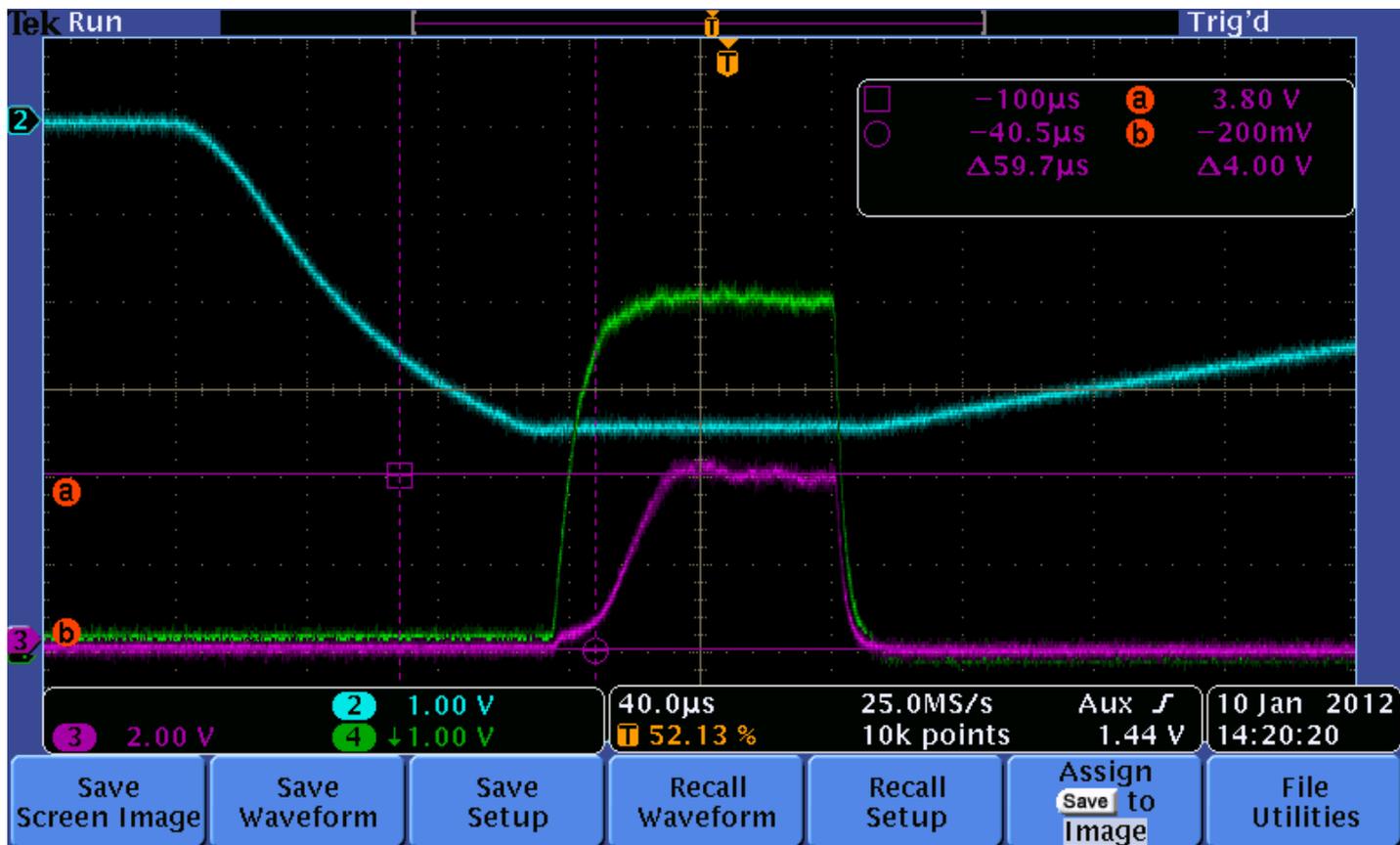
# RFQ Setup



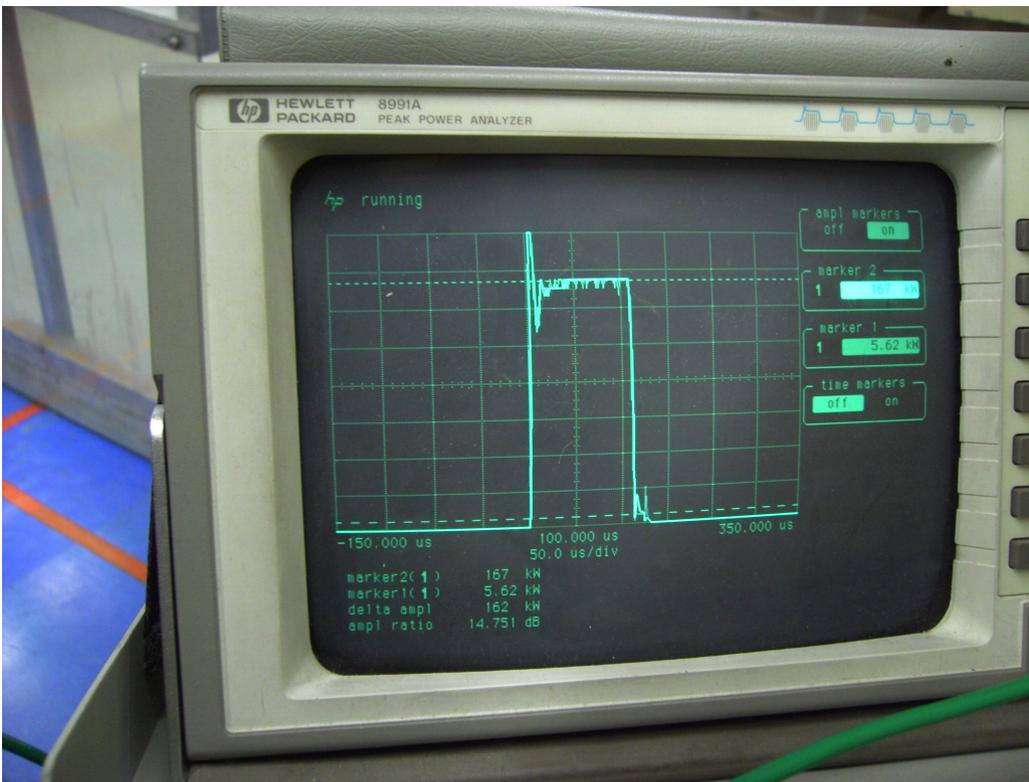
# Timed Pulse to be within RF pulse



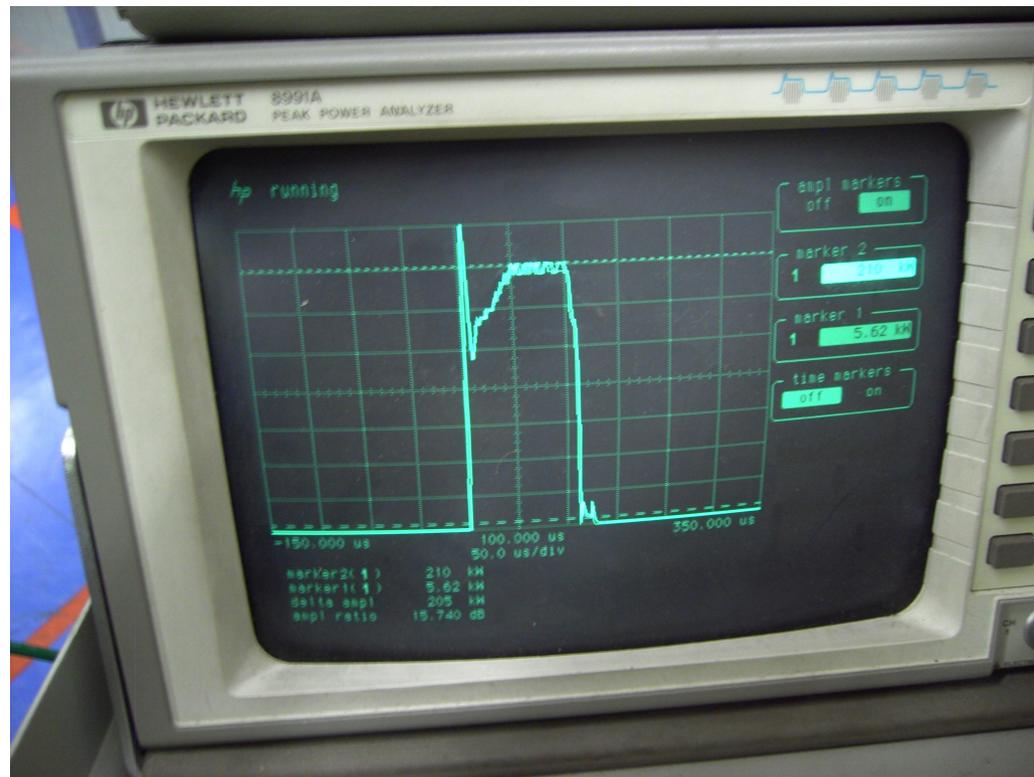
# 40 mA of beam!



# Forward power with and without beam



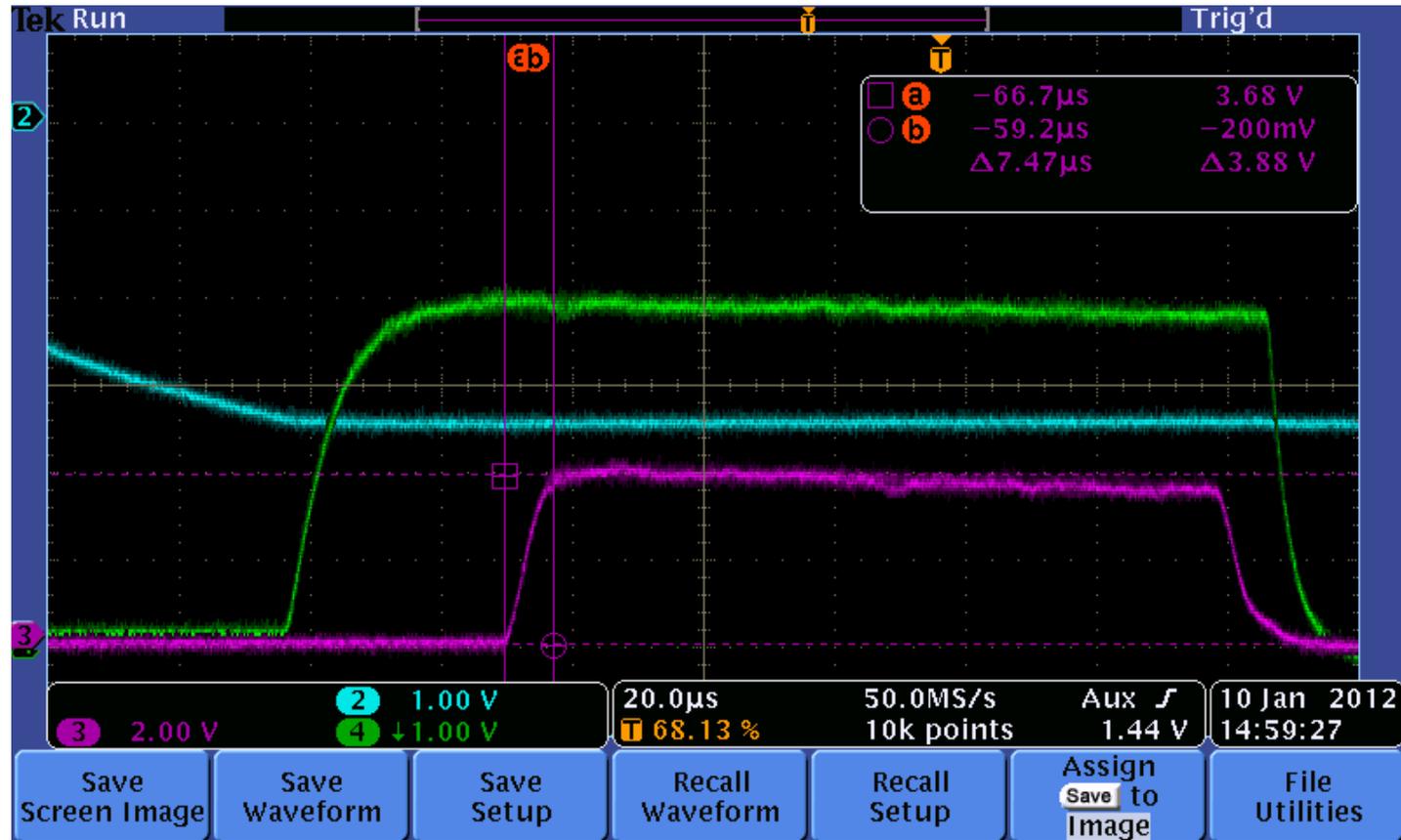
167 kW no beam



210 kW with beam

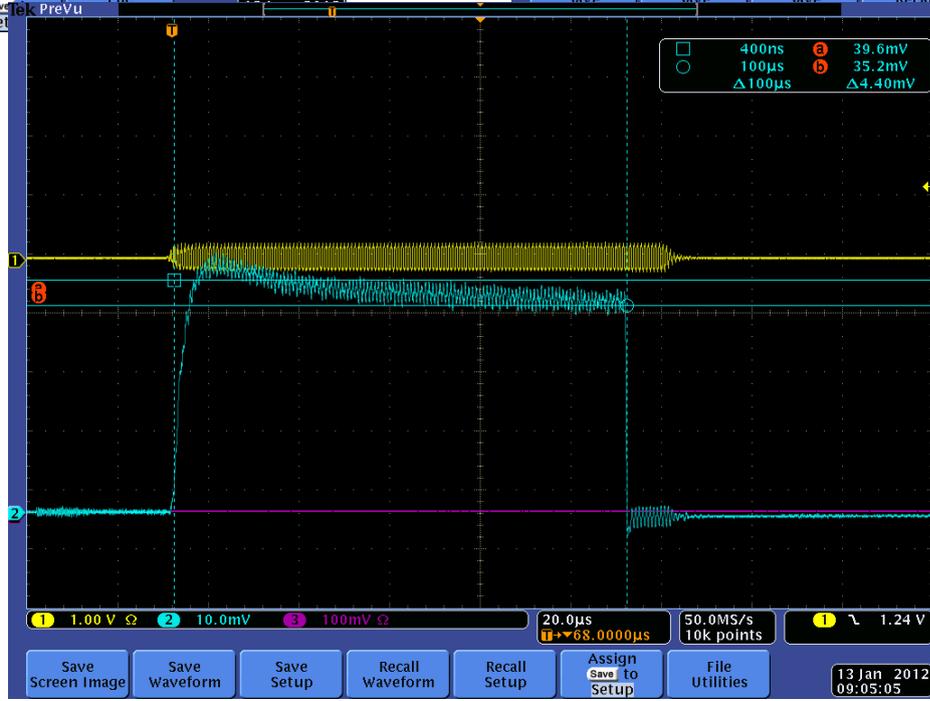
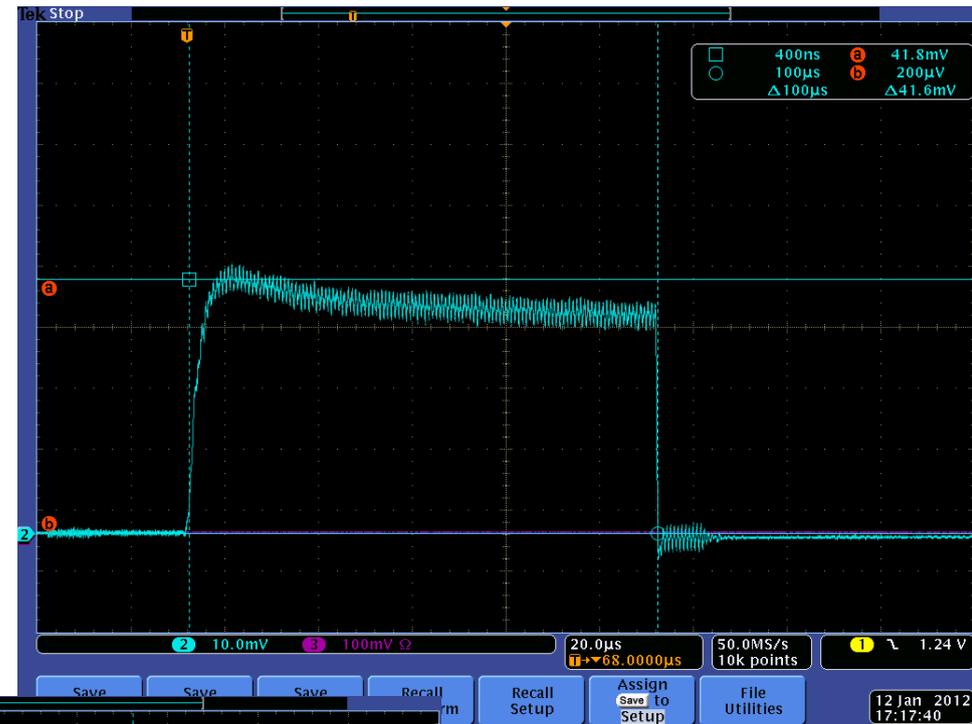
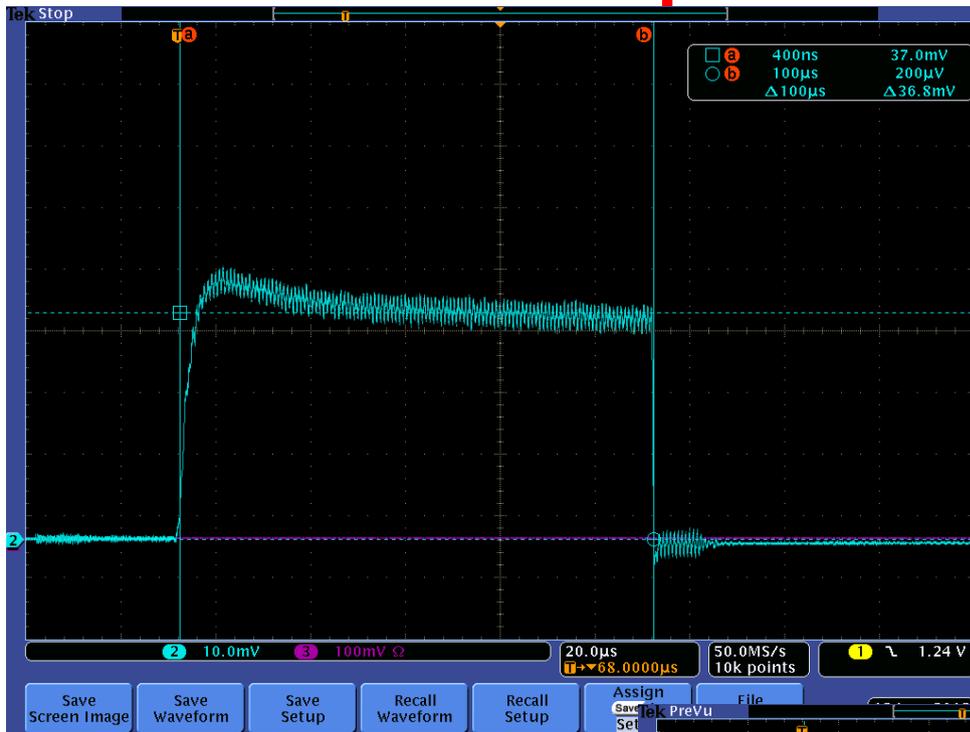
Cavity impedance change?

# Beam pulse longer than RF pulse

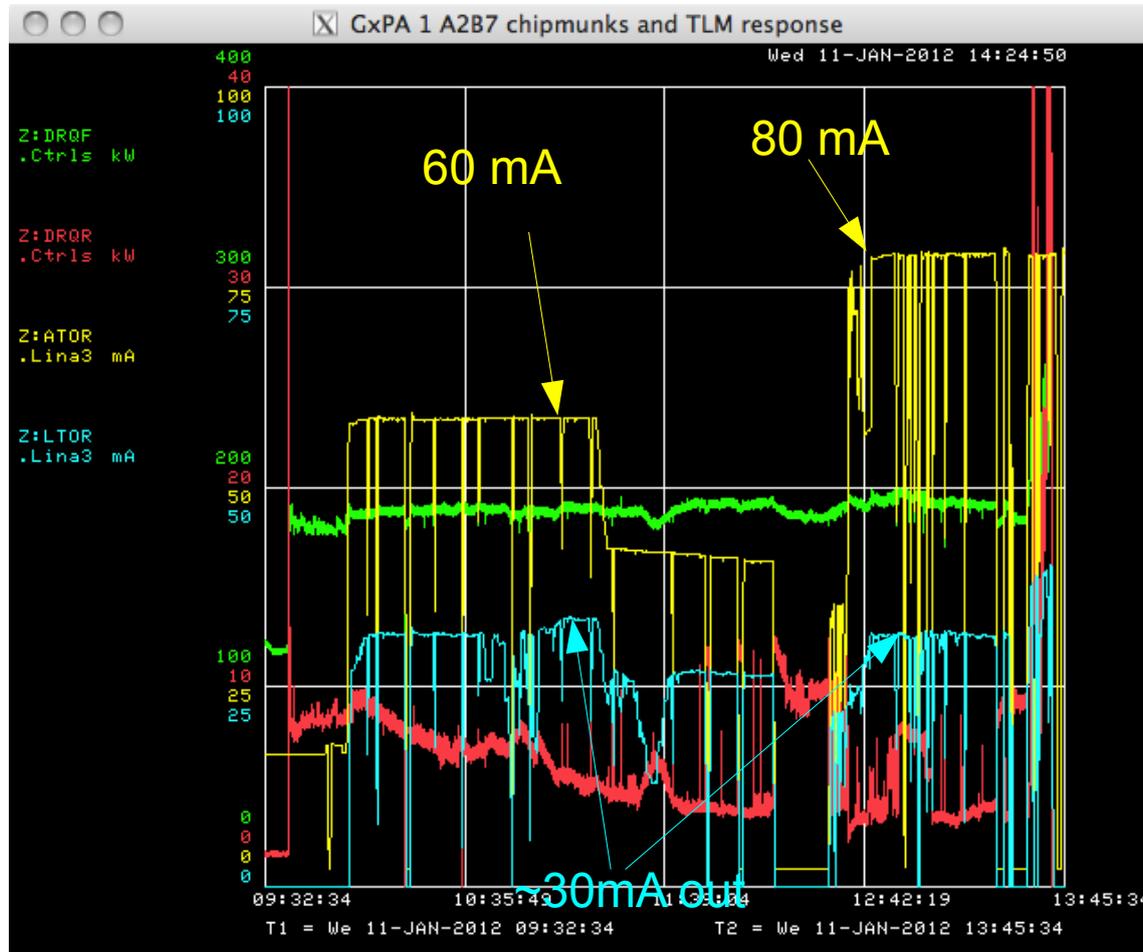


This gives hope that the Einzel lens chopper will work!

# Slope in beam current

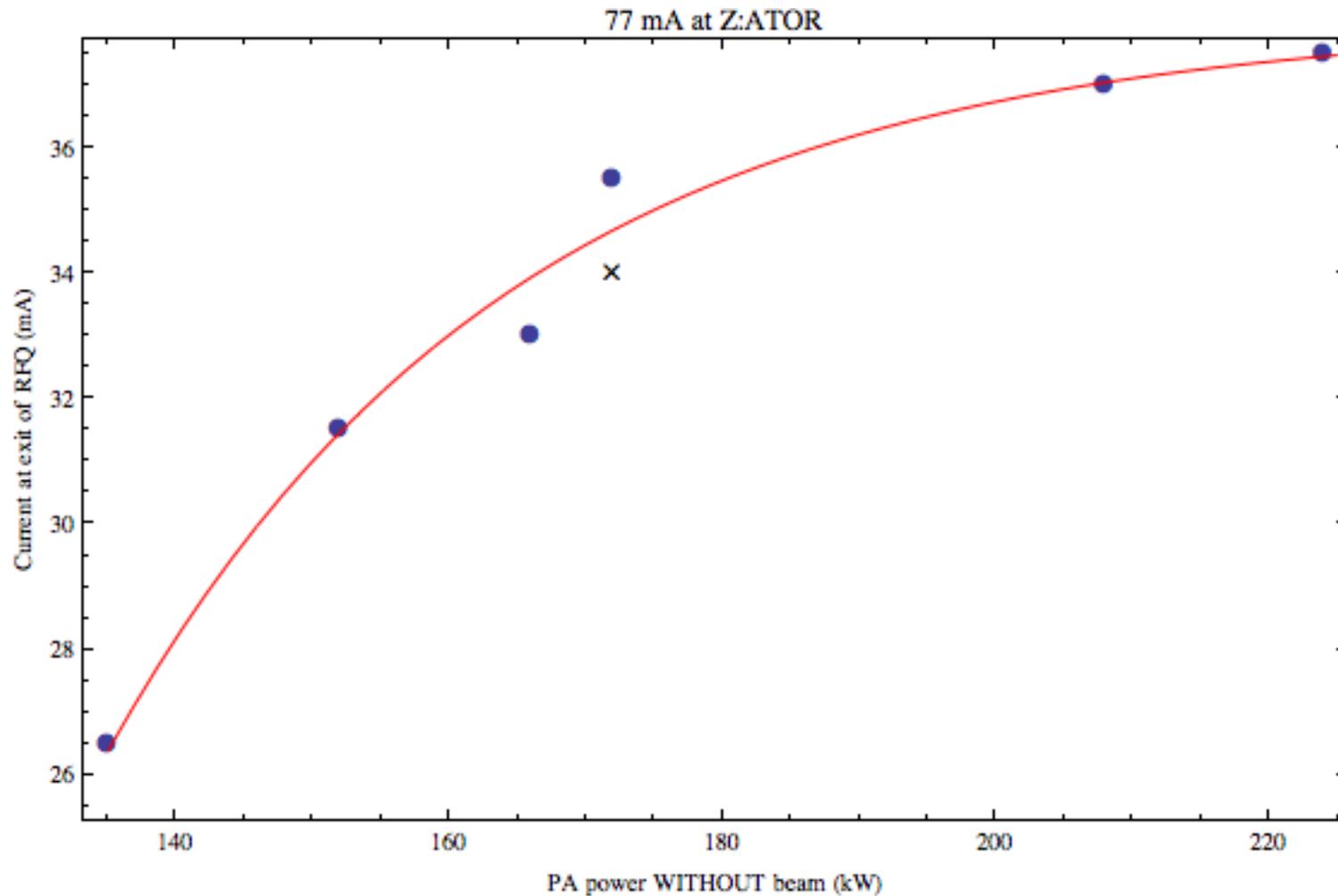


# Lowering source current increases transmission efficiency

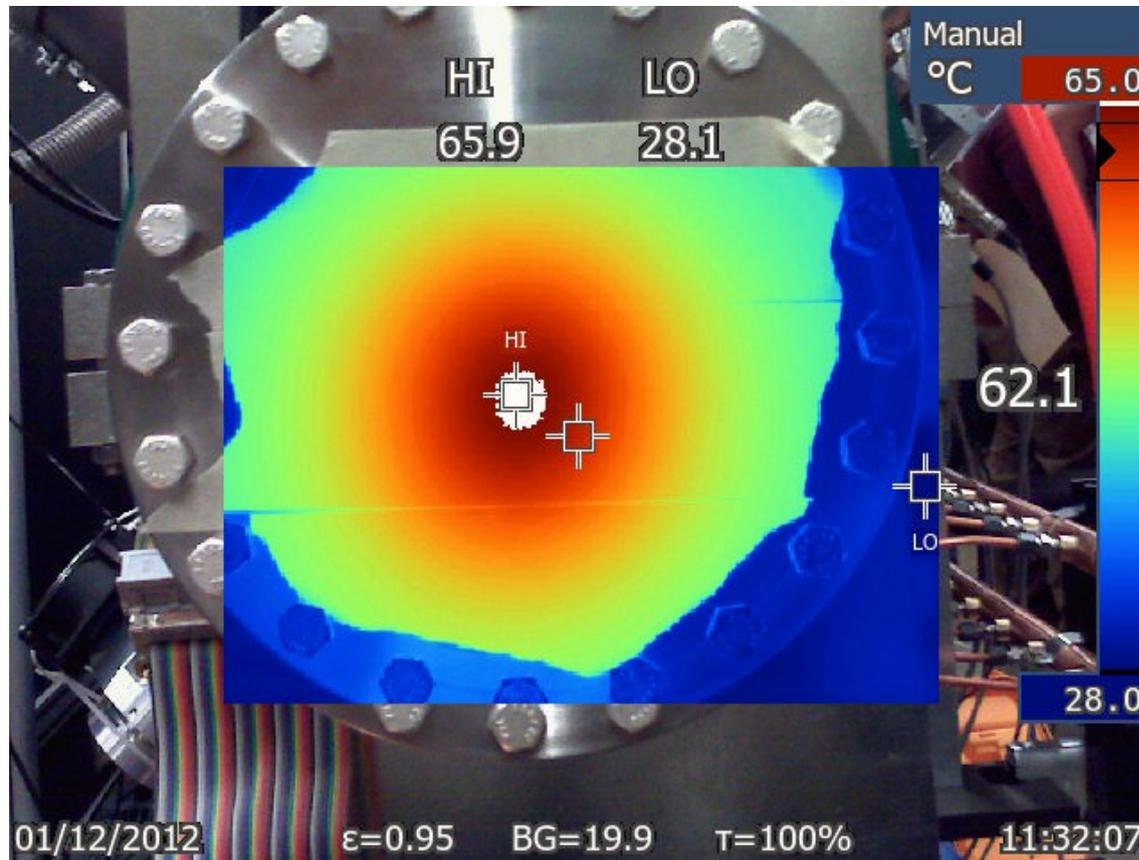


Lowering source current from 80mA to 60mA gives same transmission efficiency for the same RF power.

# RF Power and Capture Efficiency



# Temperature profile at the end of the dump.

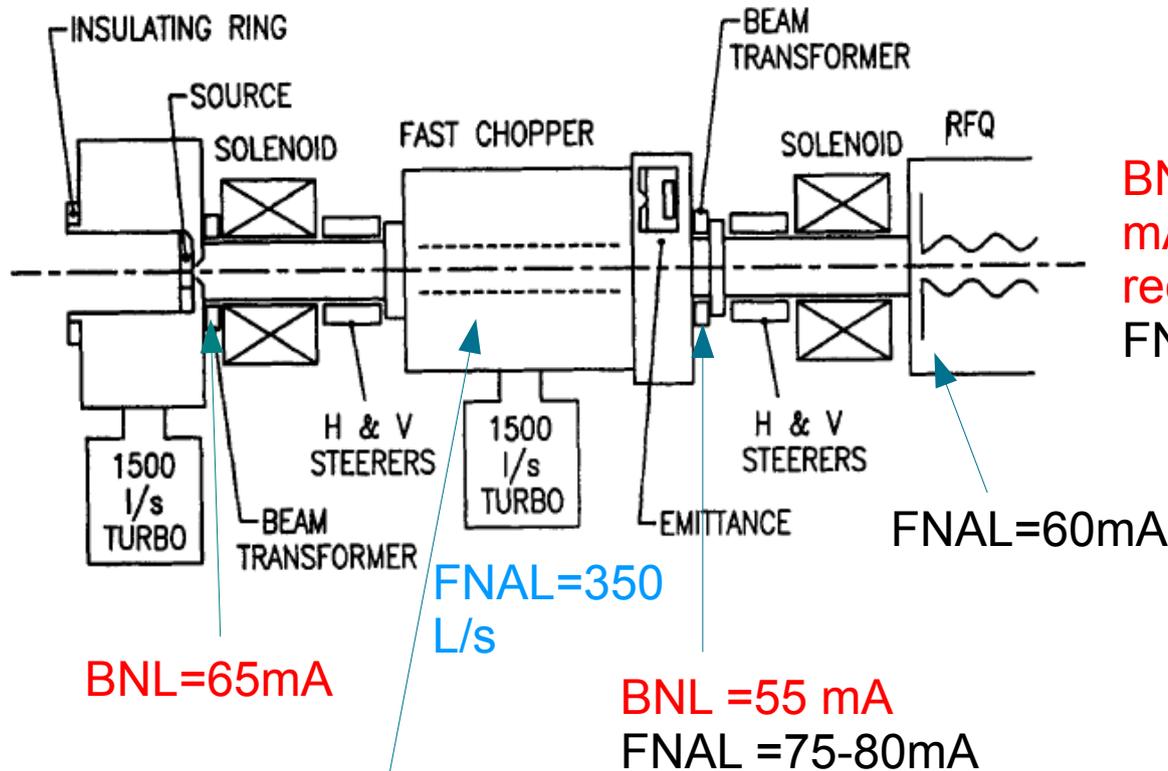


# Why are we stuck at 40 mA?

- Bad LEBT vacuum?
  - Flat distribution is indication of hollow beam in phase space. Does over neutralization cause this?
    - New pumping should resolve this.
- Source emittance is too large?
  - We don't have a good measurement of the source emittance.
    - Will be measured with emittance probes when new slide is here.

# Comparing with BNL

BNL =  $4.5 \times 10^{-6}$  torr  
 FNAL =  $1.5 \times 10^{-6}$  torr



BNL = 45 – 50 mA. (max 60 mA with source gap reduction)  
 FNAL = < 40 mA

BNL =  $1 \times 10^{-6}$  torr (Raparia, no Xe)  
 FNAL =  $8 \times 10^{-6}$  torr

RAL:  $7.5 \times 10^{-8}$  torr, 2000 L/s turbo. 55 mA at RFQ