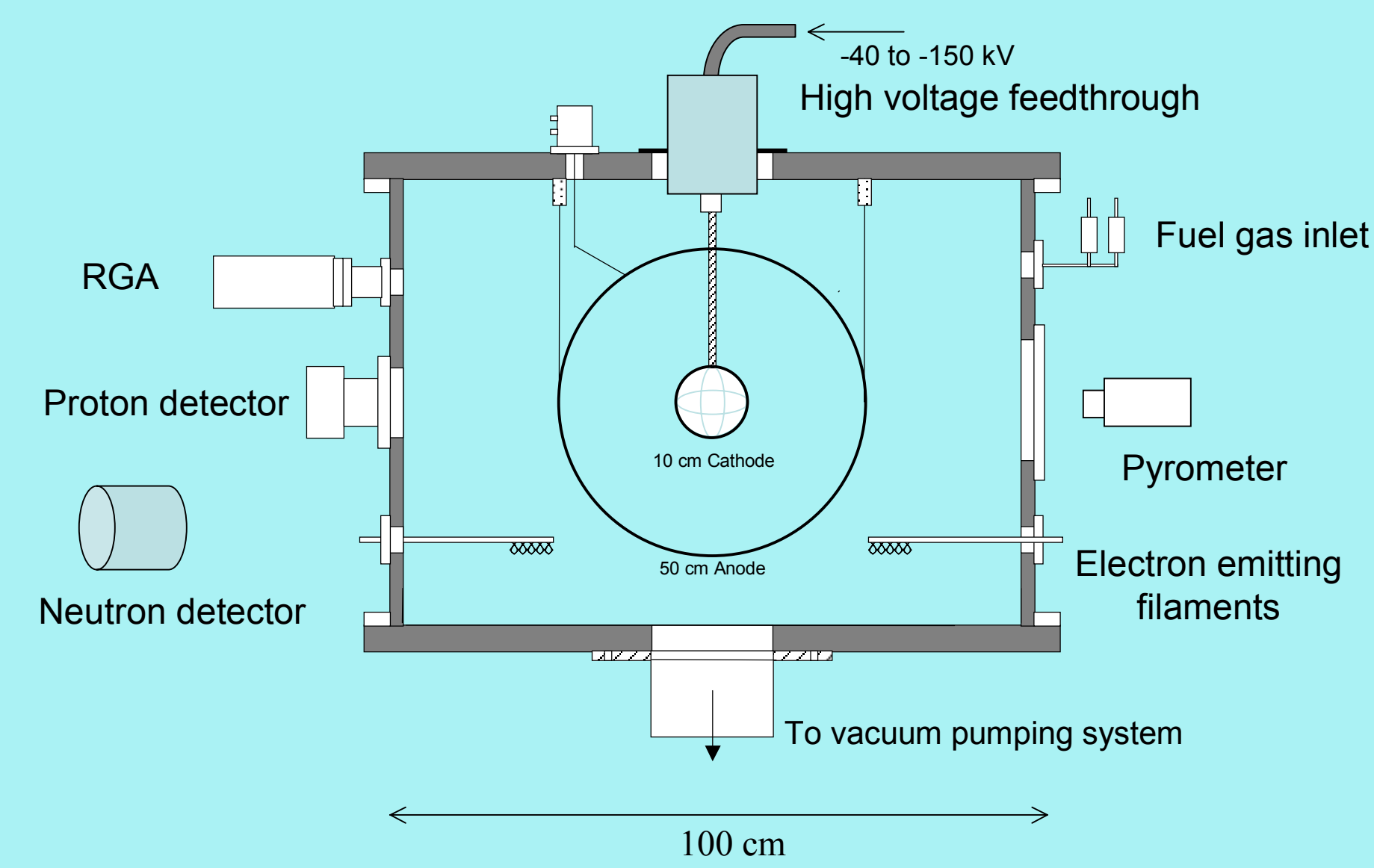
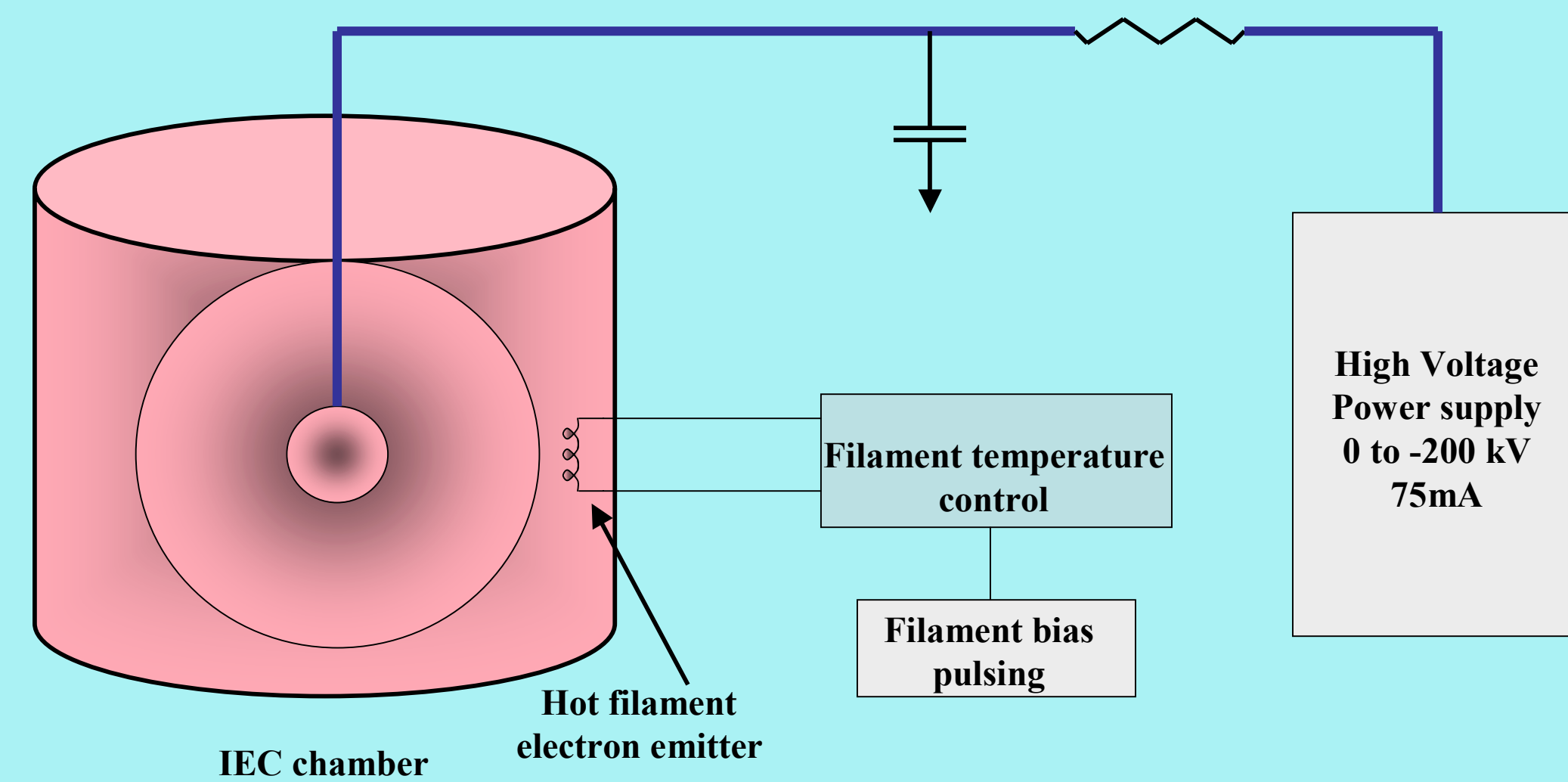


Experimental Facility

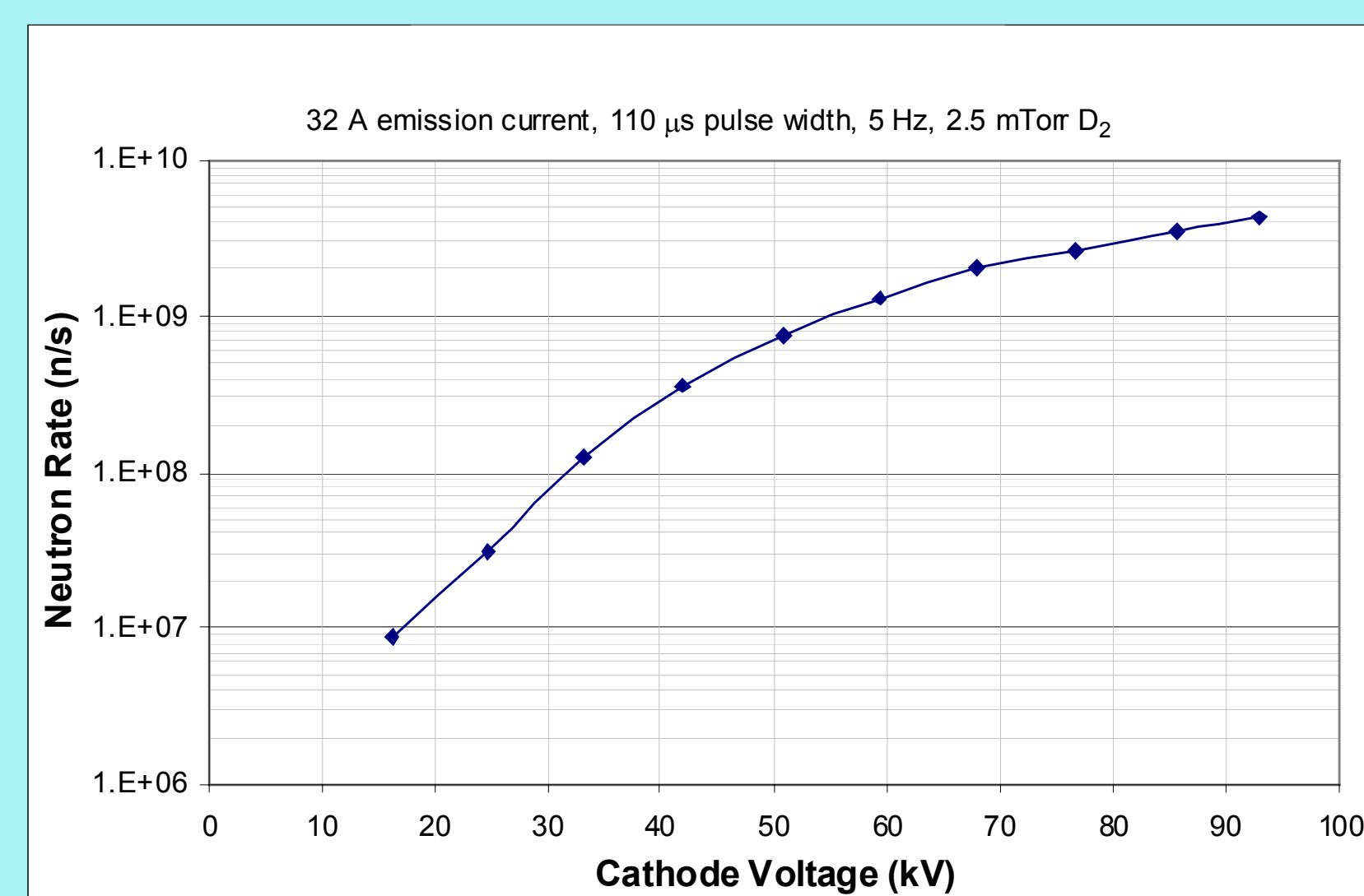
Cylindrical Aluminum IEC Chamber



Ion source pulsing produces neutron pulses

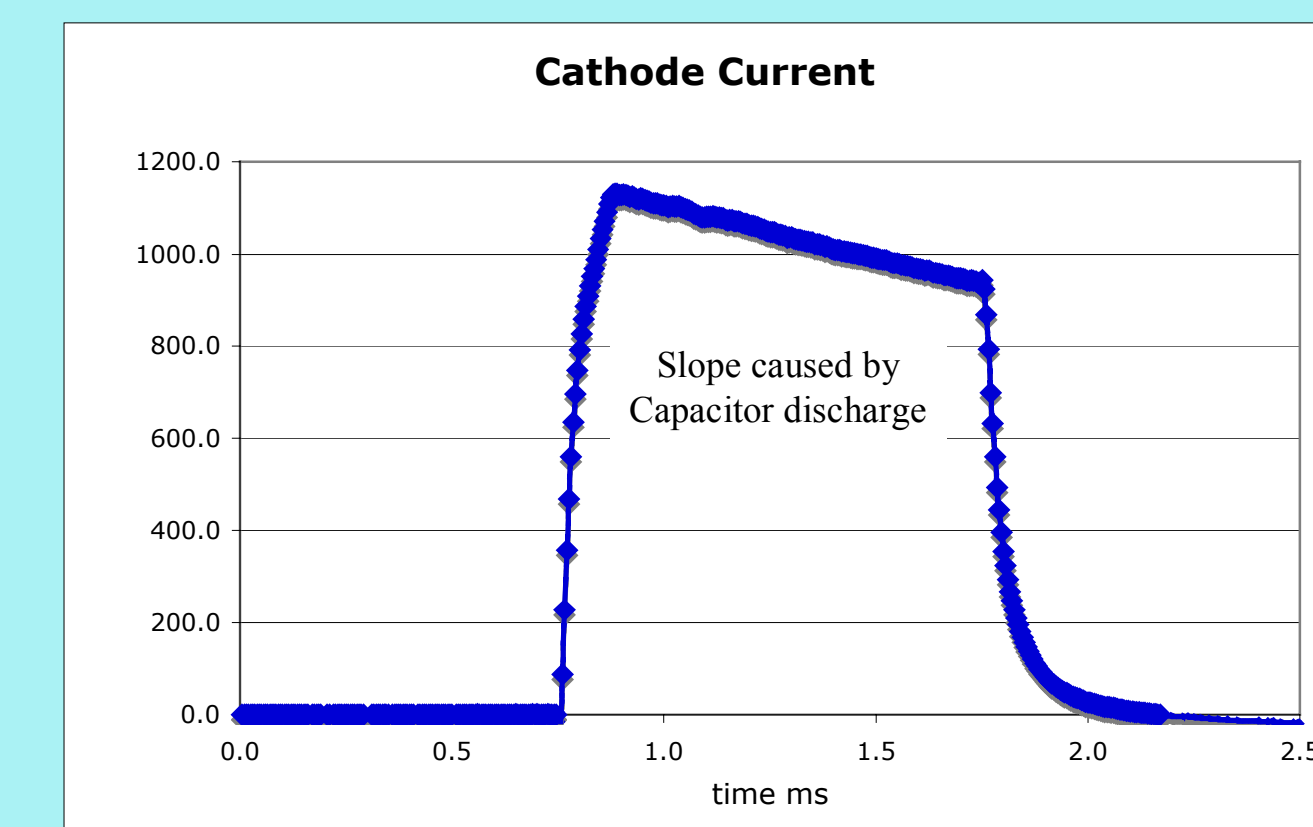
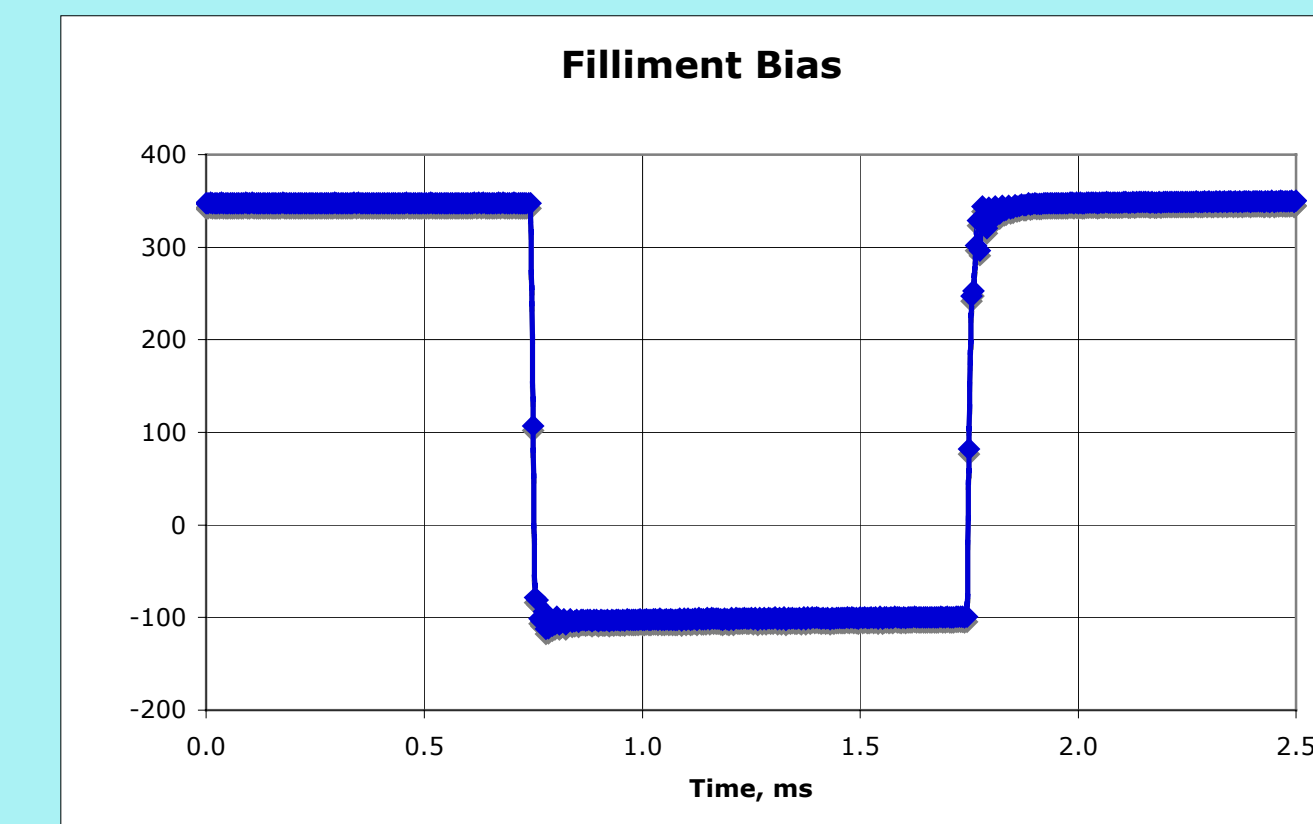


Pulsed Neutron Rate vs. Cathode Voltage

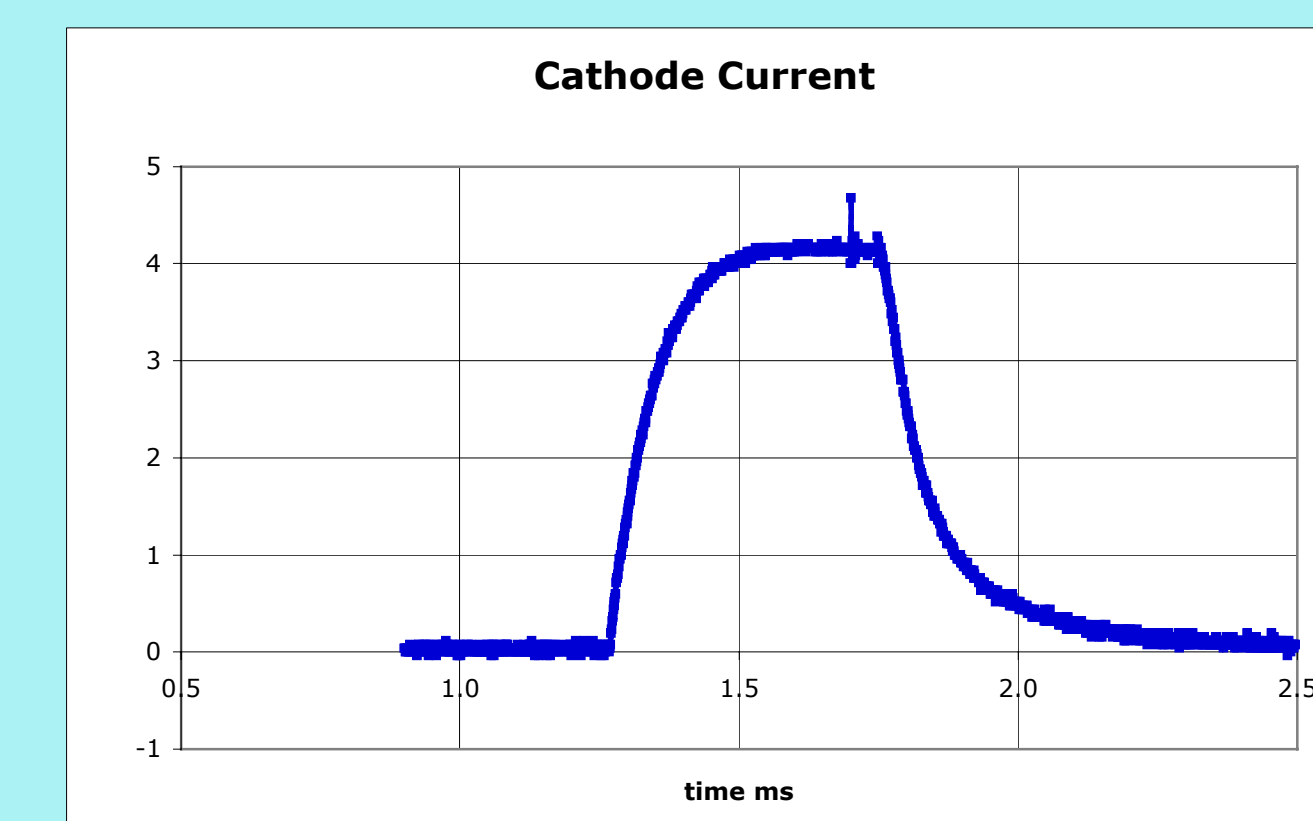


Cathode Current Pulsing

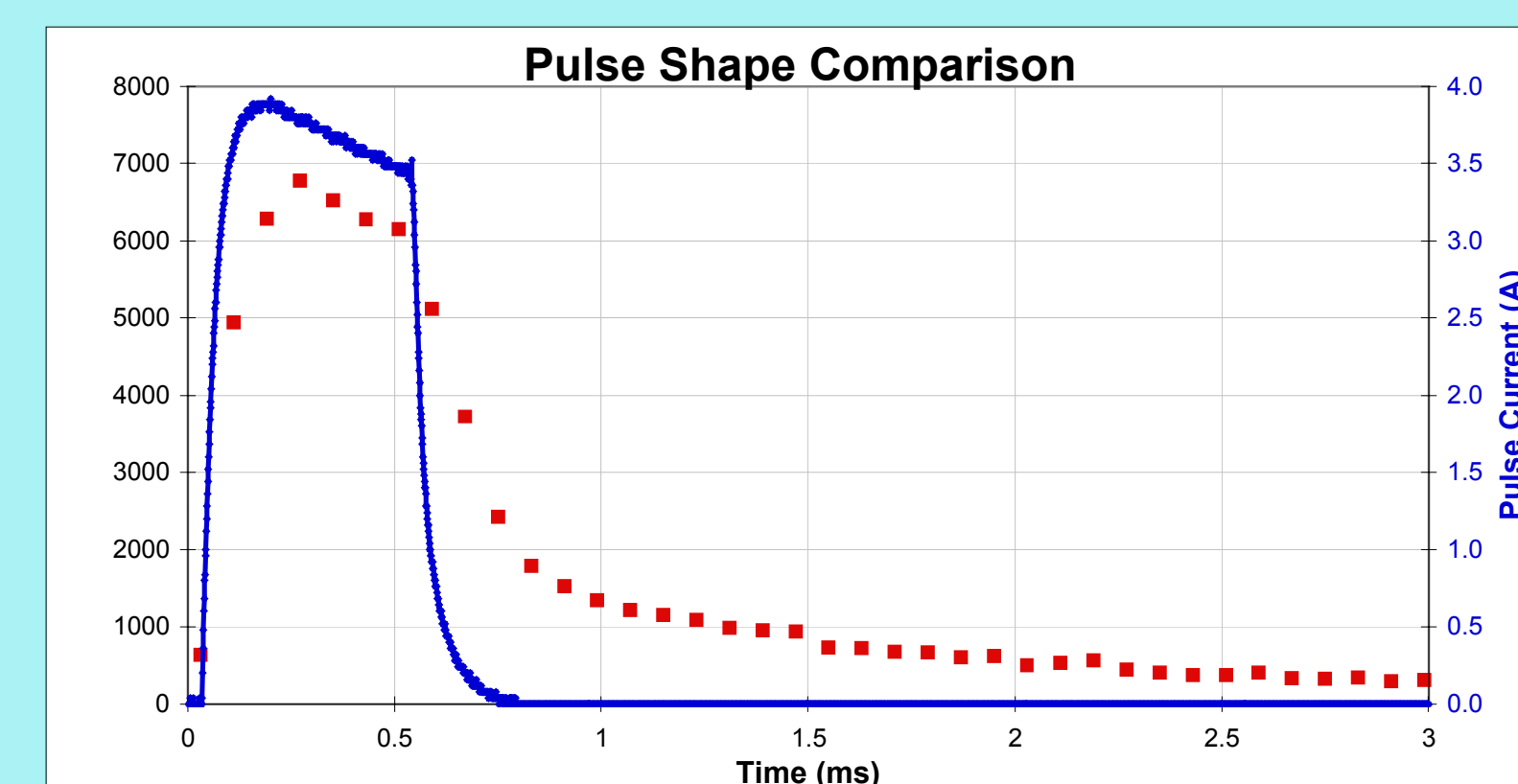
Negative filament voltage turns on electron emission and cathode current



Short current pulse shows plasma transitions

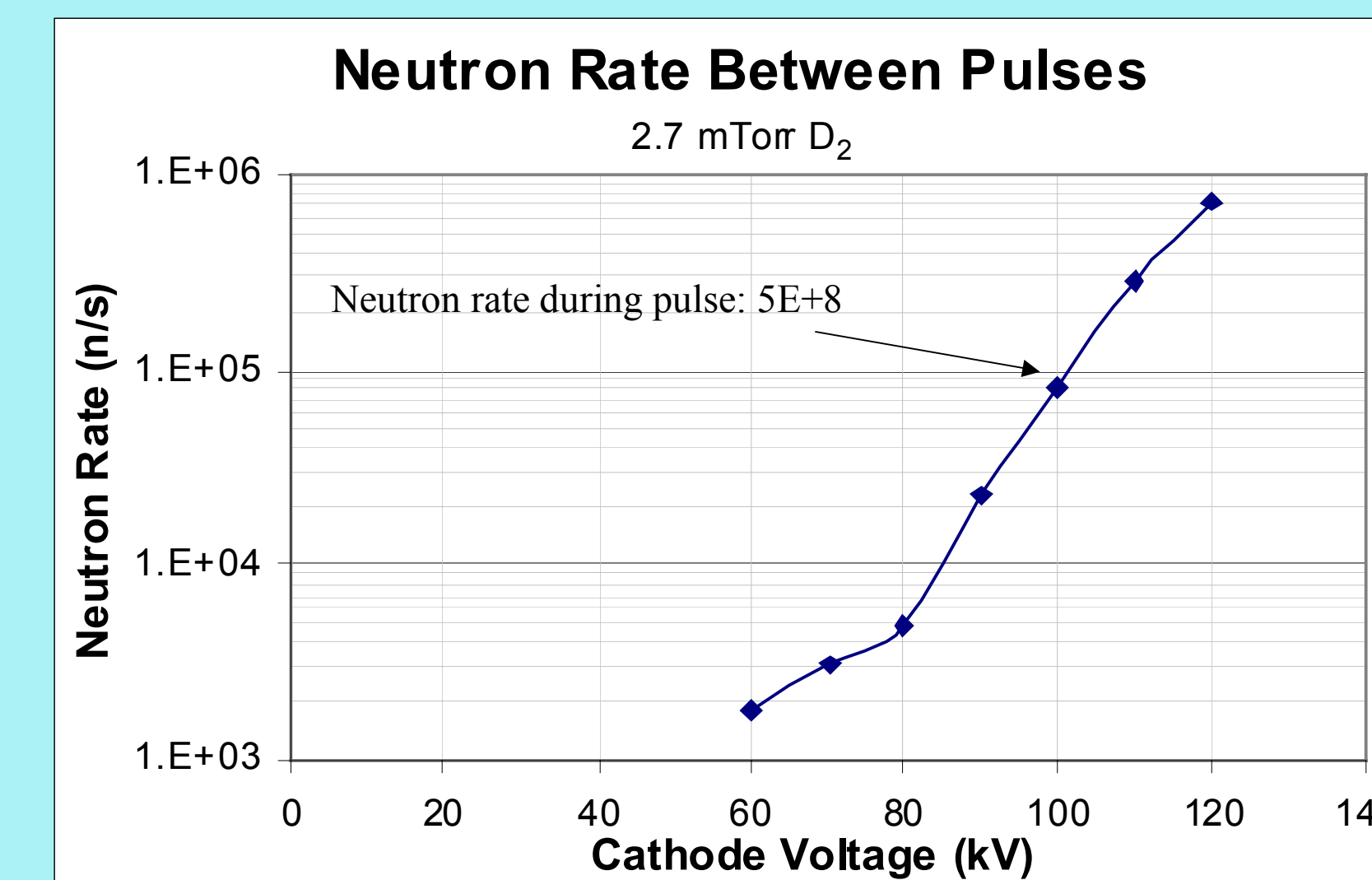
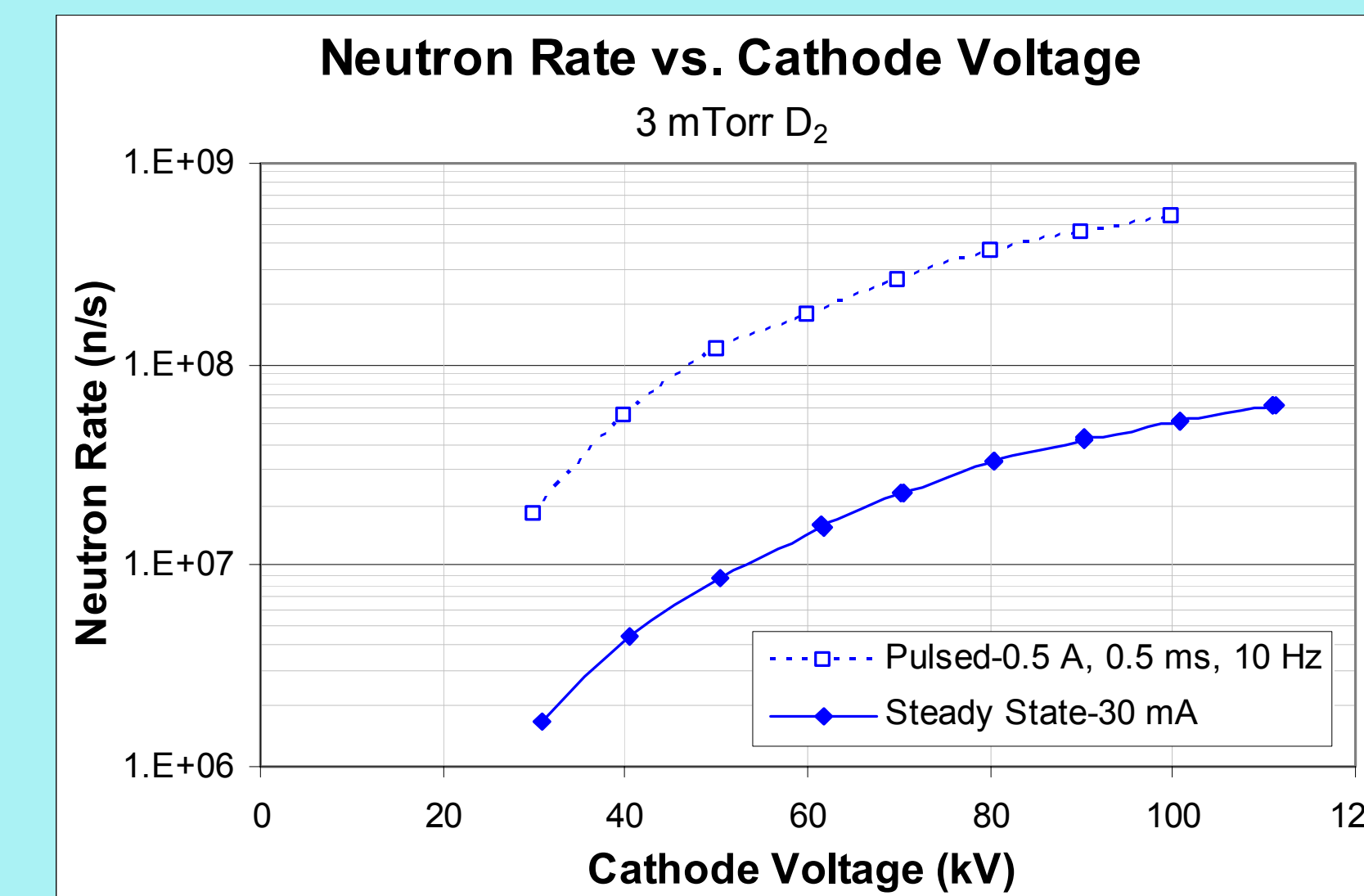
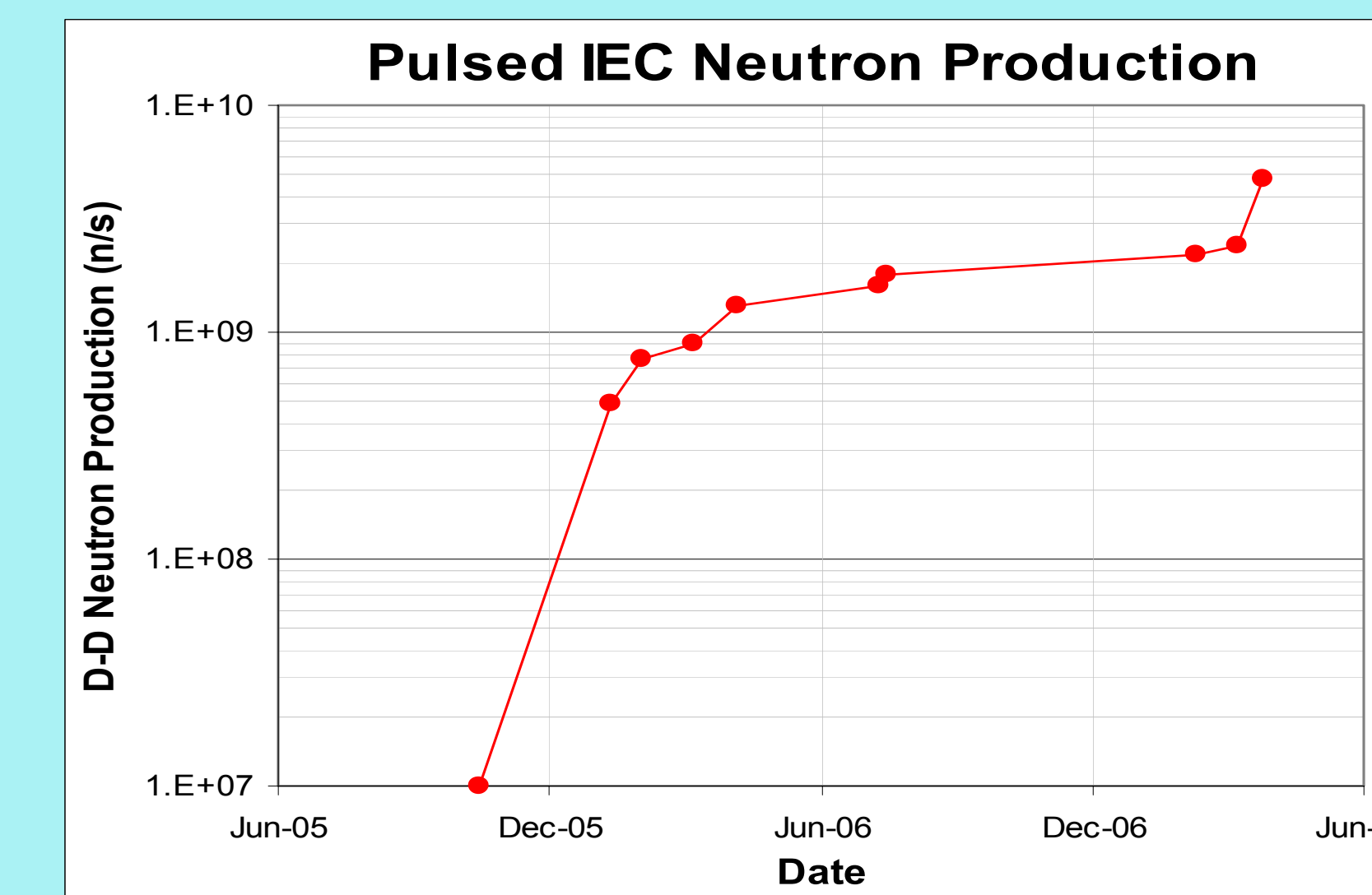


Neutron pulse shape does not match cathode current shape



Neutron Pulse Data

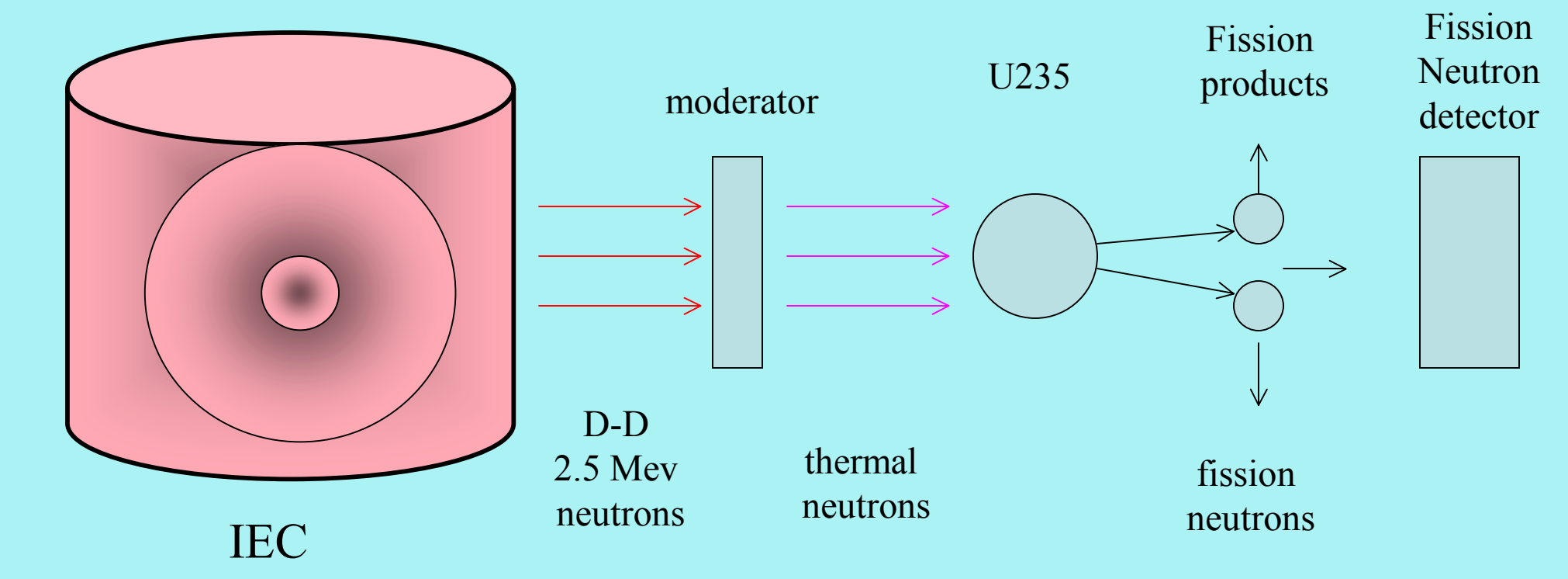
Max Cathode Voltage: 120 kV
Max Deuterium Pulse Current: 6 Amps
Max D-D Neutron Rate: 4.7×10^9 n/s
@ 96 kV, 5 A, 0.33 Pa, 110 ms pulse width, 5 Hz



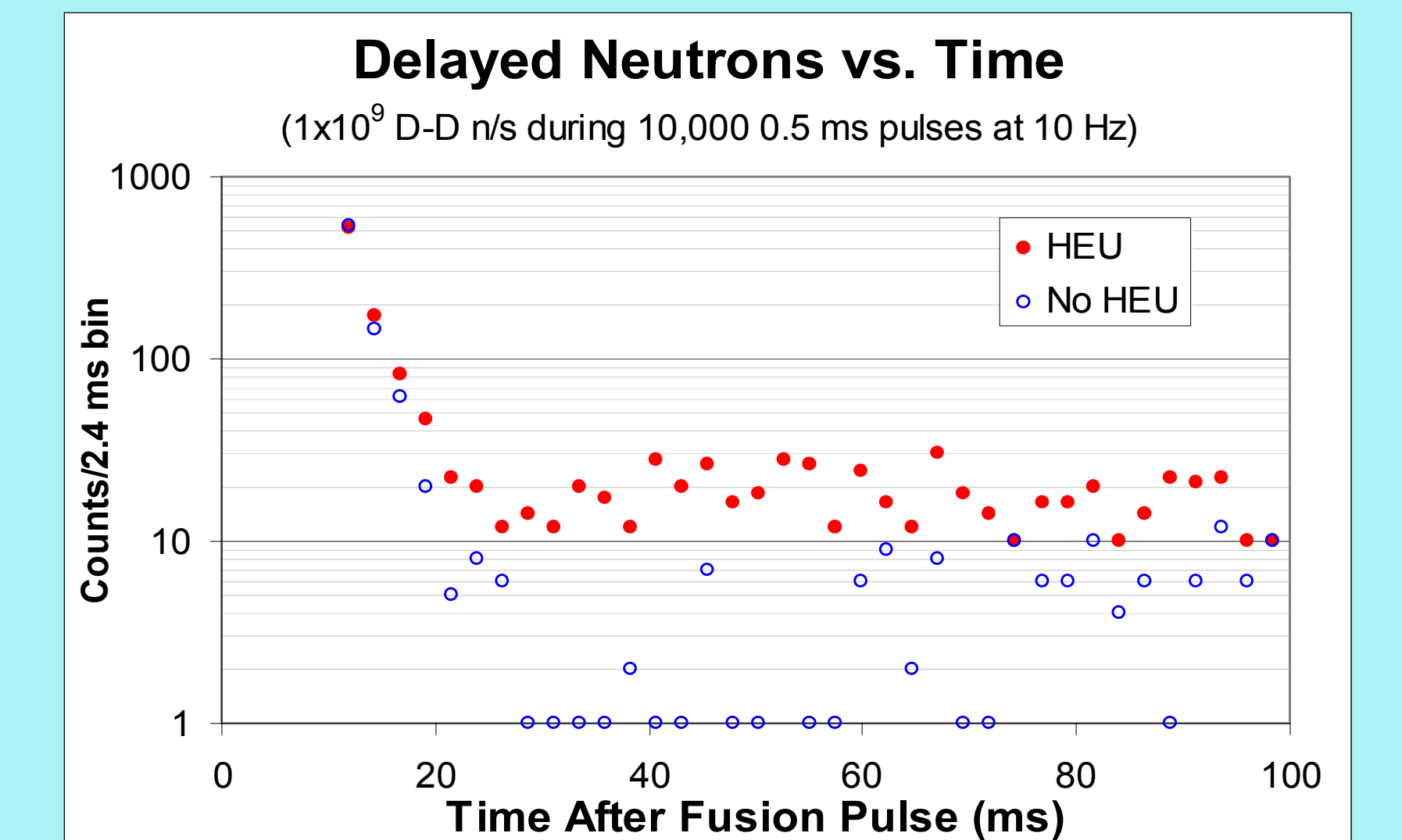
Fusion reactions still occur between pulses

HEU Activation and Detection

D-D fusion neutrons from the IEC are used to cause highly enriched uranium to create detectable fission neutrons



10 grams of highly enriched uranium



Future Work

