DC RUNS

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We have done five runs of applying DC power to estimate the pulses at the surface of the core. Table 1 lists all runs time, helium or hydrogen, and the core. Assuming there is a linear relationship between Heater Power drop vs. DC Power at each core temperature. Figure 1 presents the slopes (M) vs. the core temperatures for all runs. Figure 2 through Figure 6 are the Heater Power, Temperature, DC Power and DC Volt vs. time.

Table 1: DC Runs

08/29/2016	H2	ipb2-27b
10/03/2016	He	ipb1-29b
10/12/2016	He	ipb1-29b
10/15/2016	H2	sri-ipb2-27b
10/25/2016	H2	ipb1-29b

$$QPow - TermHS - PCBHS - LT - LPCB - coreQPow = 0$$

Where
$QPow$: Q pulse Power in Watts measured at Pi Filter. The power that is going into the Q pulse board and termination
$TermHS$: Termination Heat Sink Power
calculated by
Termination Heatsink Flowrate LPM
Termination Heatsink H2O In T
Termination Heatsink H2O Out T

$PCBHS$: Q Pulse PCB Heatsink Power
caluclated by
Q PCB Heatsink Flowrate LPM
Q PCB Heatsink H2O In T
Q PCB Heatsink H2O Out T

LT : Loss of TermHS, and $LT = \lambda_T * TermHS$

$LPCB$: Loss of PCBHS, and $LPCB = \lambda_P * TermHS$

$coreQPow$: Core Q power is the power deposited in the core

$$coreQPow = (Vrms1 - Vrms2) * Vrms2/Rterm$$

$$Q_{reaction} = (Q_{flow} + Q_{loss}) - (Q_{heater} + Q_{pusle})$$

Where $Q_{reaction}$: heat flow from reaction
Q_{flow} : heat flow captured by the calorimeter's jacket
Q_{loss} : heat flow to the ambient air
Q_{heater} : heater power Q_{pulse} : power dissipated into the reactor core from electric pulse
Replace equation by helium and no QPulse Hydrogen and Helium then minus helium and No QPulse for Hydrogen and Helium, we have:

$$Q_{reaction} = (Q_{flow}+Q_{loss})_h-(Q_{flow}+Q_{loss})_{he}Q_{pusle})_h-((Q_{heater})_h-(Q_{heater})_{he}-Q_{heater_n oQ})_h-Q_{heater_n oQ})_{he}$$