

Demonstration
of Excess Heat
from the JET Energy
NANOR®
at MIT

Mitchell R. Swartz and Peter L. Hagelstein





2012 CF/LANR IAP Course at MIT



Prof. Peter Hagelstein

Dr. Mitchell Swartz

January 23-31, 2012



Demonstration of Energy Gain From A ZrO₂-PdD Nanostructured CF/LANR Quantum Electronic Device At MIT



- A CF/LANR quantum electronic component (NANOR), containing active ZrO₂-PdD nanostructured material at its core, has shown energy gain during, and after, the January, 2012 IAP MIT Course on CF/LANR.
- This two terminal, self-contained, Series VI NANOR features a new composition, internal structure, simpler connectivity, and superior handling properties.



- Most importantly, these NANORs are pre-loaded so that LANR activation is separated from loading.
- For verification, the calorimeter had parallel diagnostics including heat flow measurement, and repeated ohmic (thermal) control calibration.



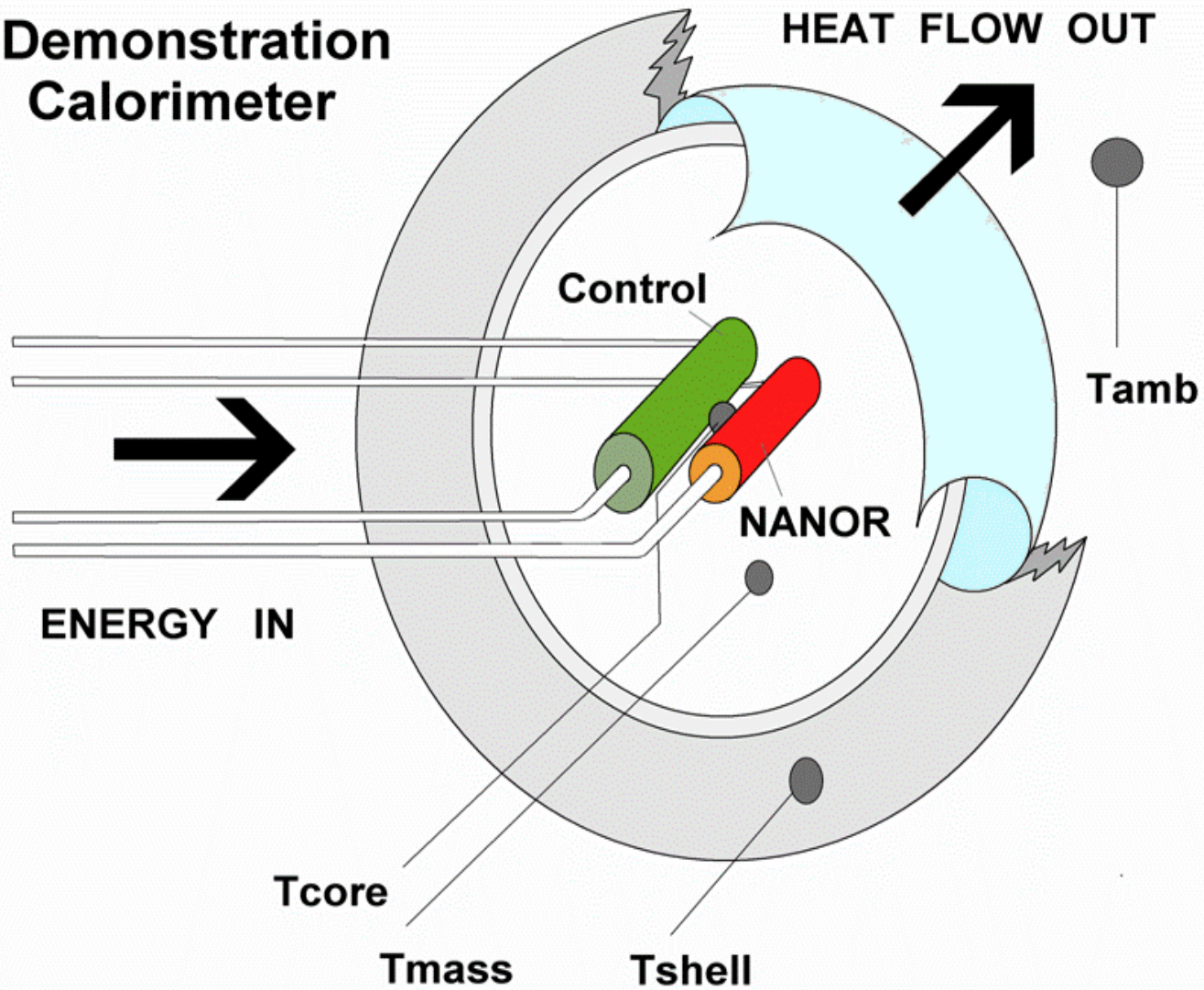
- The CF/LANR quantum device demonstrated reproducible, controllable, energy gain which ranged generally from 5 to 16 [energy gain of ~ 14.1 during the course demonstration].
- During February and March, a range of experiments examined the impact of H-field intensity and various driving sequences on the NANOR performance, which has continued to produce excess energy, as corroborated by daily calibration.



- This open demonstration of an active ZrO₂-PdD nanostructured quantum electronic device has confirmed the existence, reproducibility, and better control, of CF/LANR, and has shown that it may be superior CF/LANR nanostructured material, configuration, and means to activate these important systems.



Demonstration Calorimeter



JET Energy, Inc. (c) 2012 Dr. M Swartz



Improved Calorimetric Noise Measurement to Increase the likelihood of reliability of measured XSE

- Input electrical power defined as $V \cdot I$.
- Input energy = time-integral ($V(t) \cdot I(t)$).
The excess energy is defined and derived as time integral of $[P_{\text{output}}(t) - P_{\text{input}}(t)]$.
- The instantaneous power amplification factor (non-dimensional) is defined as $P_{\text{out}}/P_{\text{in}}$, as calibrated by at least one electrical joule control [ohmic resistor].



■ Input electric power = $V * I$

Voltage accuracy: $<0.015 \pm 0.005$ volts, or $\sim \pm 0.5\%$

Current accuracy: $\pm 1\%$

Voltage, current, temperature, heat flux, generated elec.)

Nyquist sampling issue: $>.1 - 1$ Hertz, 24 bit resolution.

- Usually driven at 10 nano- to 2000 microAmperes
- Usually 4-terminal electrical conductivity measurement of cathode.



Time Integration, Nyquist-sufficient sampling and Noise Measurement
Increase the likelihood of reliability of measured Excess Energy

- Data Acquisition: 24+ Bit Resolution
- Nyquist issues: 0.2 - 10 Hertz Sampling
- Time-integration of Input electrical and semi-quantitatively derived output power
Rules/out peaks, and false positives.
- Noise Power Measurement – Rules out false positives



EXCESS HEAT IN NANORS™

Determination by:

- dT/P_{in} input-power-corrected dT
- HF/P_{in} input-power-corrected dT
- Time-integrated, ohmic control calibrated, waveform checked, calorimetry



DEMO

VI-3ACL131C2





2012 LANR/CF IAP Course at MIT
Cambridge MA, January 23-31, 2012



CF/LANR OPEN DEMONSTRATION

featuring: JET Energy NANOR
Series 6 Run EJan30B
for: MIT IAP CF/LANR Course

Specimen: JET Energy, Inc. NANOR VI-33ACL131C2

Power Gain

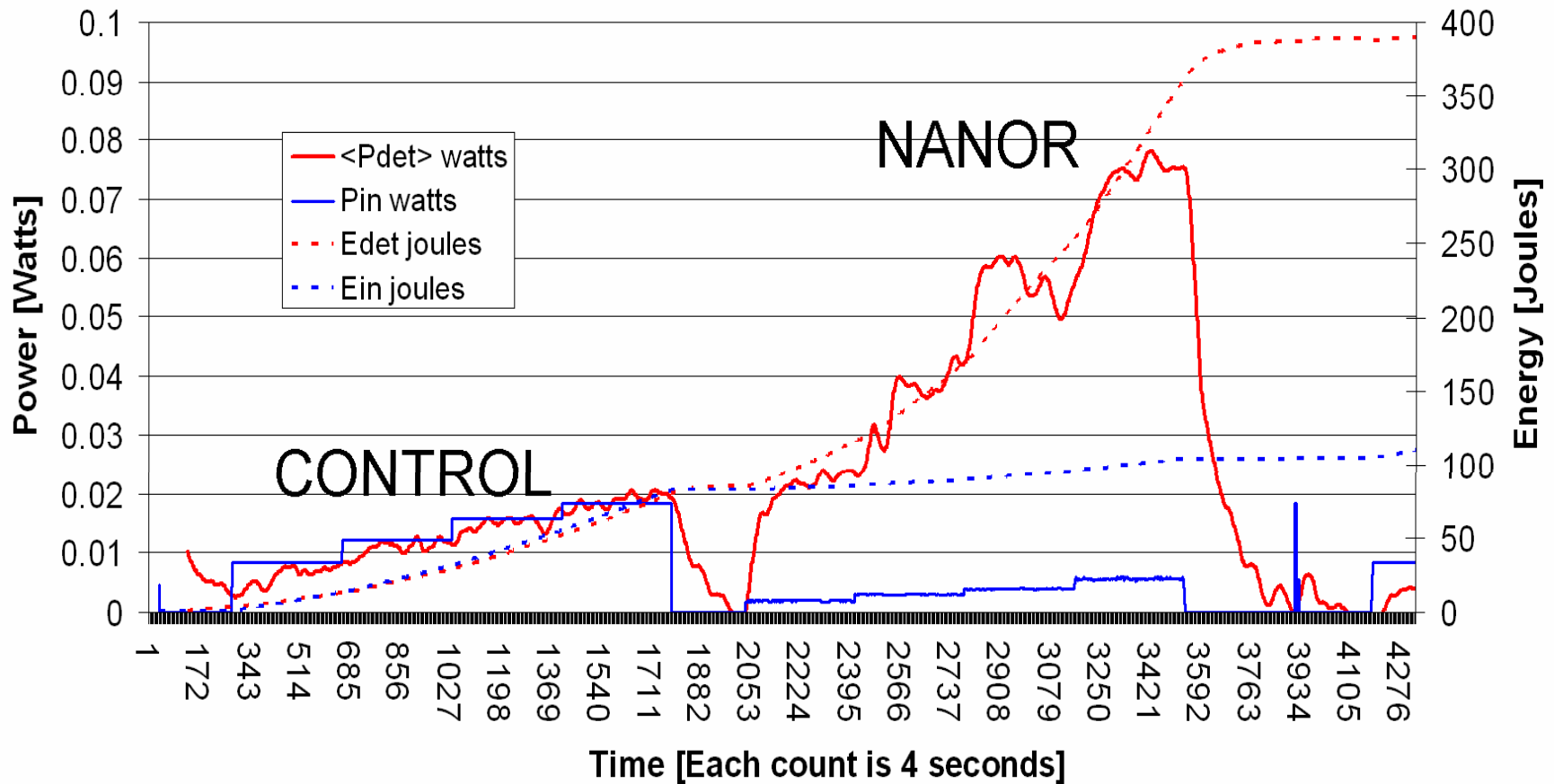
- by dT/Pi: ~ 12.3 to 14.2 (1423% XS)
- by dHF/Pi: HF detectors not working
- by Calorimetry ~ 12.5 to 13.3

Energy Gain

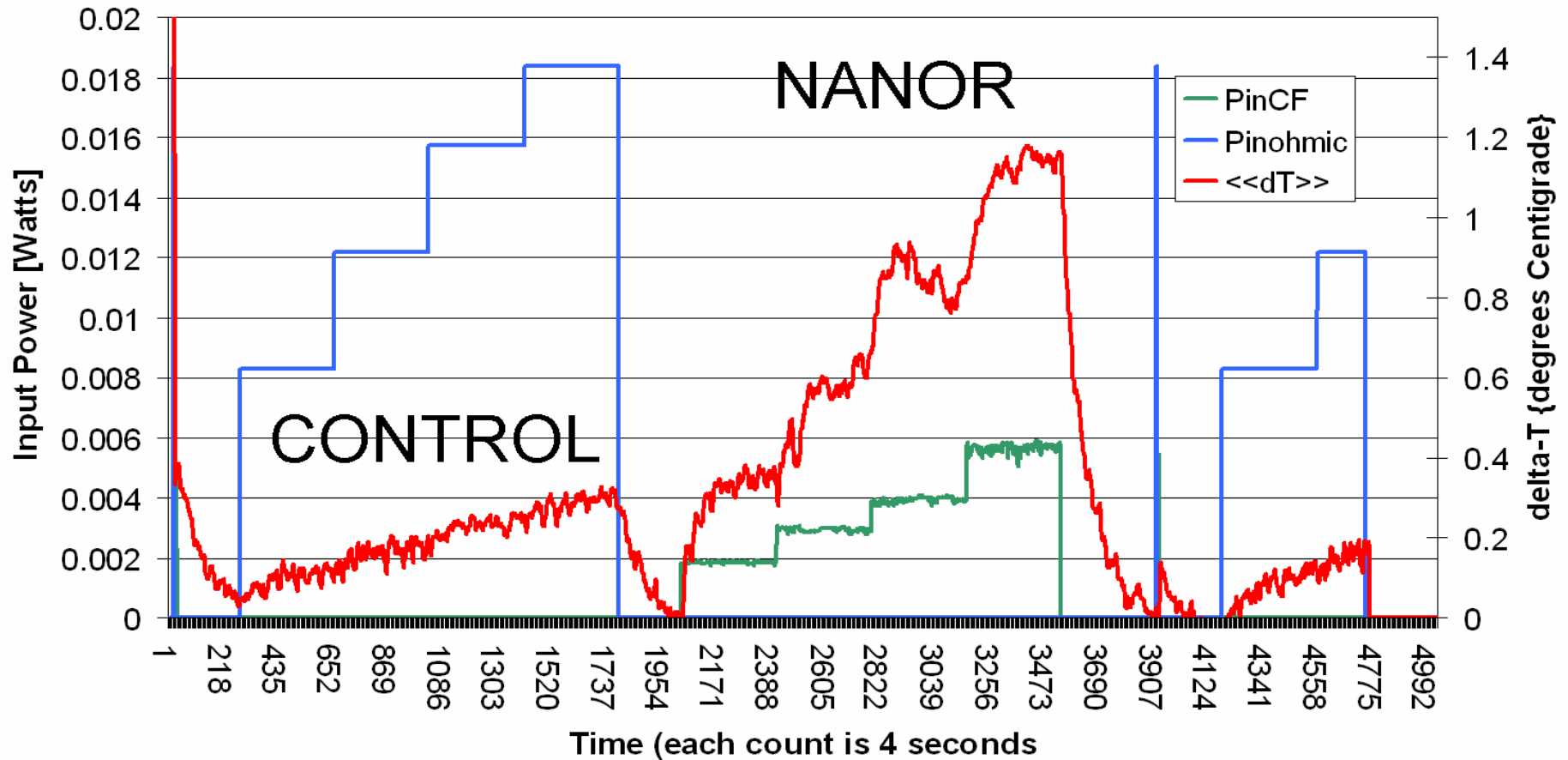
by Calorimetry ~ 14.1 XSE 283.5 Joules



Input Power and Energy (and Detected Power and Energy)
 JET Energy, Inc. Driving Calorimeter and NANOR
 Series 6 VI-33ACL131C2 Run EJan30B -
 MIT IAP CF/LANR Course - Dr. M. Swartz 1/30/2012

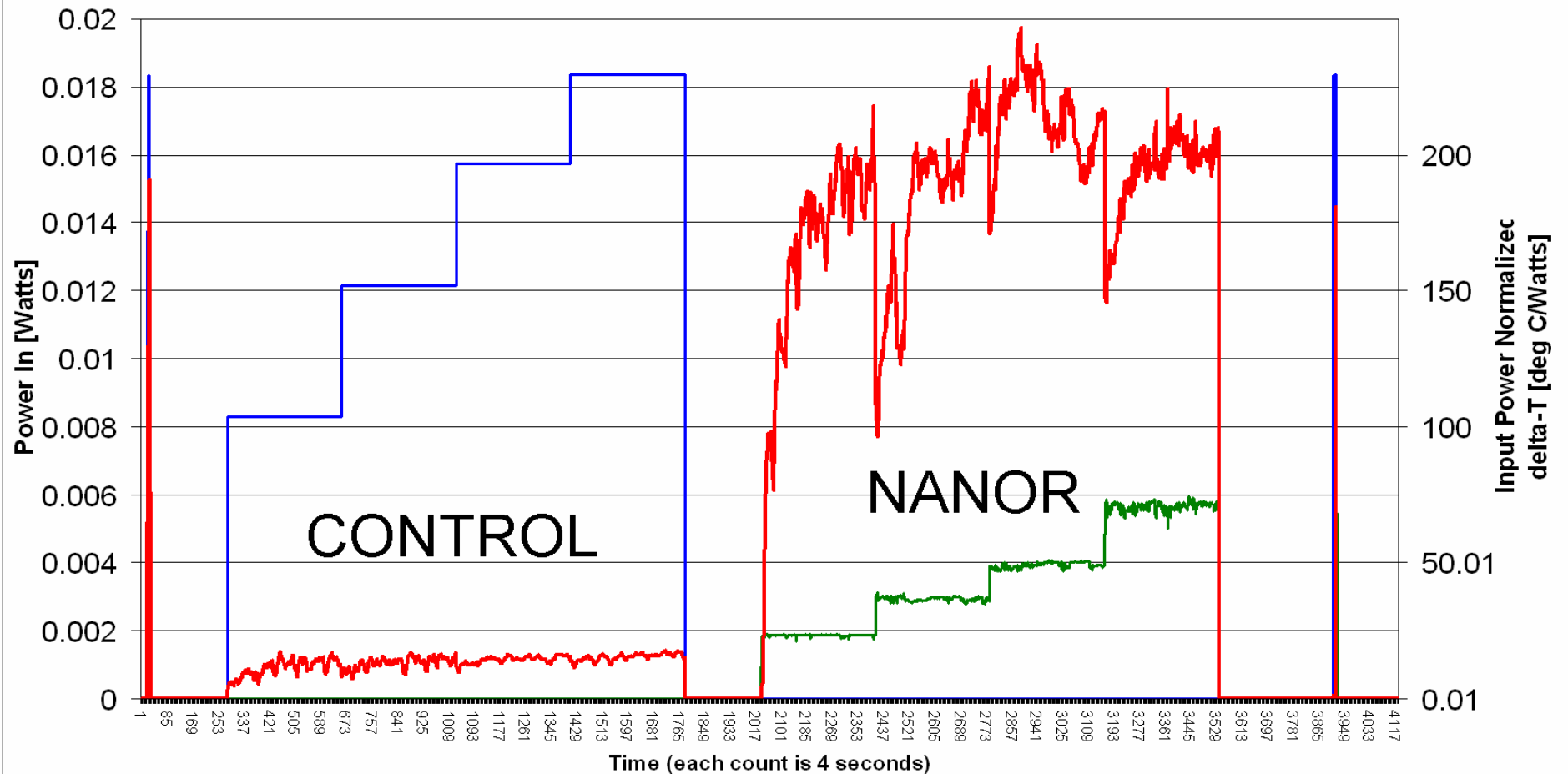


delta T and Input Power
JET Energy, Inc. Driving Calorimeter and NANOR
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MIT IAP CF/LANR Course - Dr. M. Swartz 1/30/2012



delta T (Normalized to Input power) and Input Power
 JET Energy, Inc. Driving Calorimeter and NANOR
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- PinCF
- Pinohmic
- dT/Pin



EXCESS HEAT IN NANORS™

NANOR VI-33ACL131C2 EJ30C
(evening after Demo)

Power Gain Determination by:

- dT/P_{in} = 1096%
- HF/P_{in} = 1103%
- Calorimetry = 993%

Energy Gain = 7.92

XSE = 1594.9 J

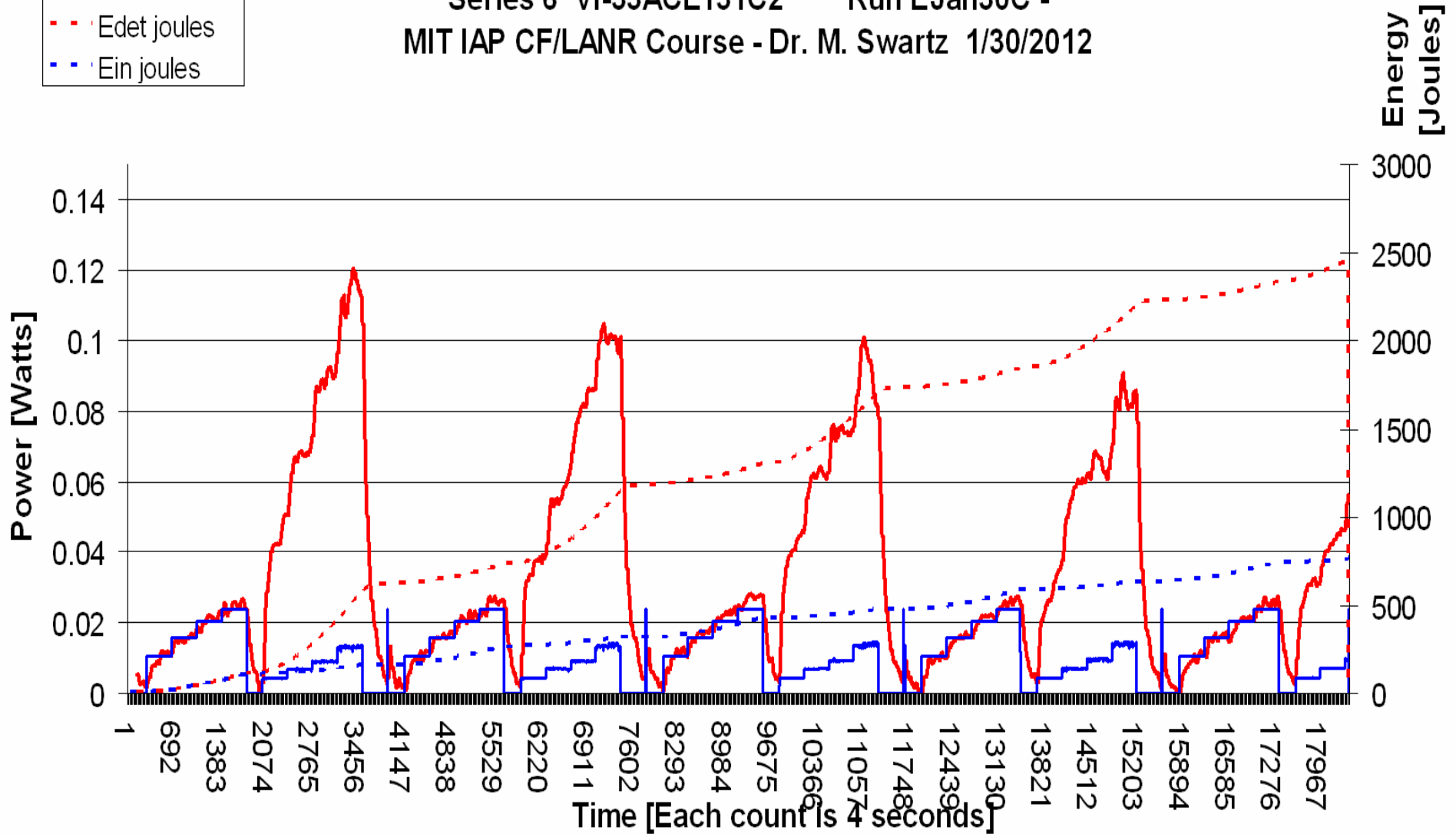
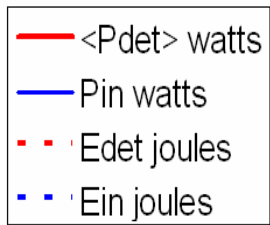


Input Power and Energy (and Detected Power and Energy)

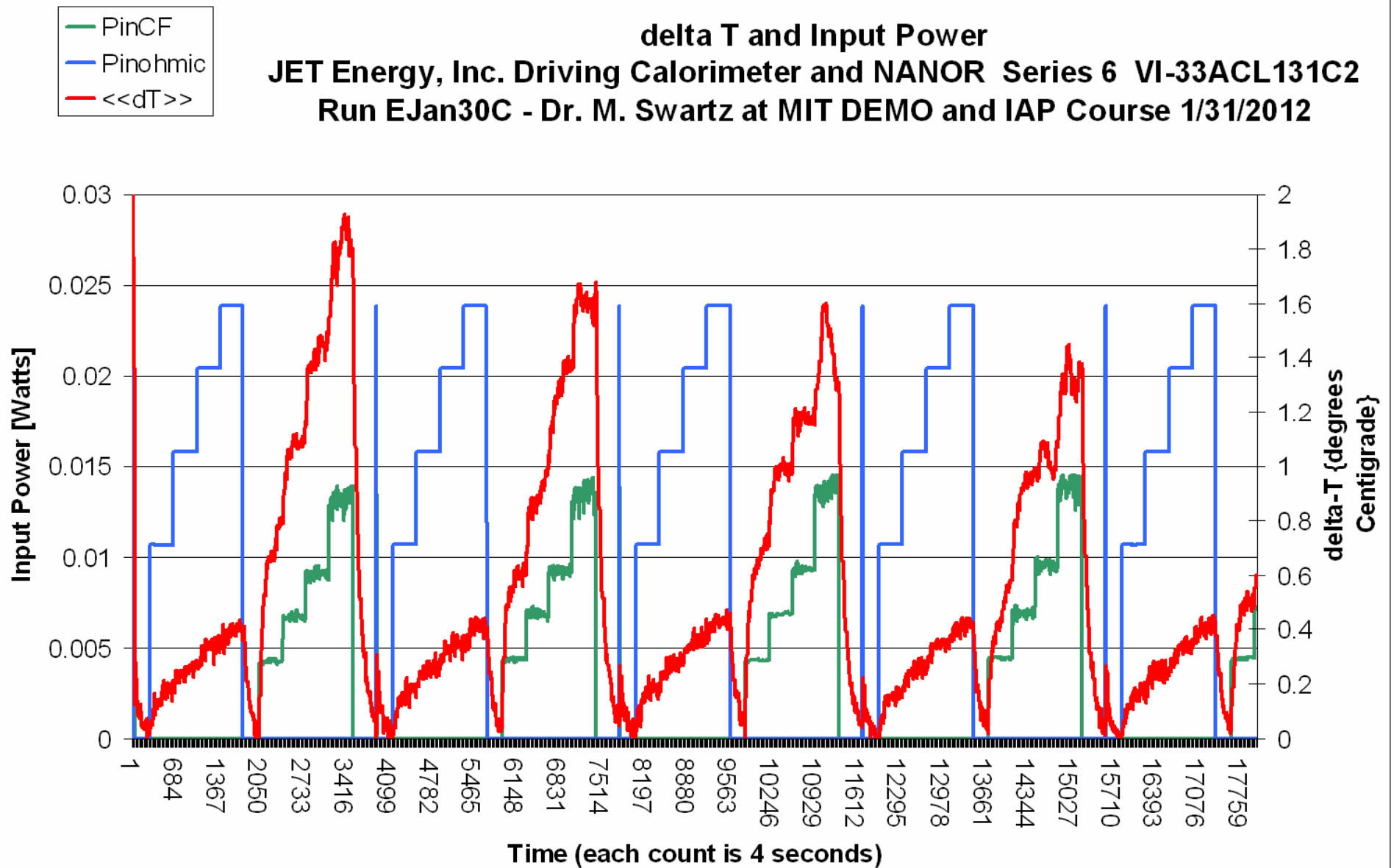
JET Energy, Inc. Driving Calorimeter and NANOR

Series 6 VI-33ACL131C2 Run EJan30C -

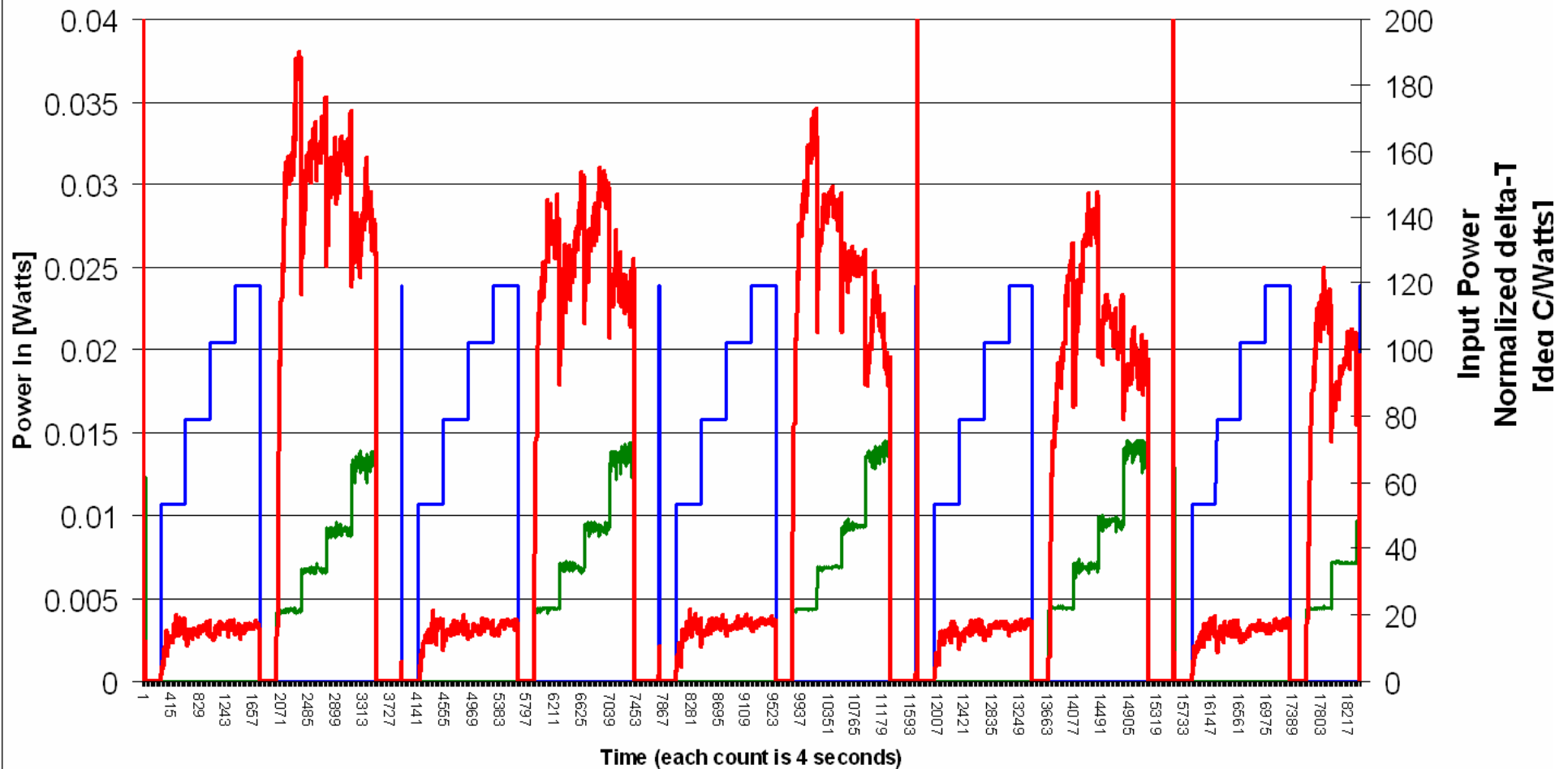
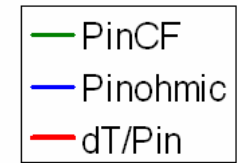
MIT IAP CF/LANR Course - Dr. M. Swartz 1/30/2012



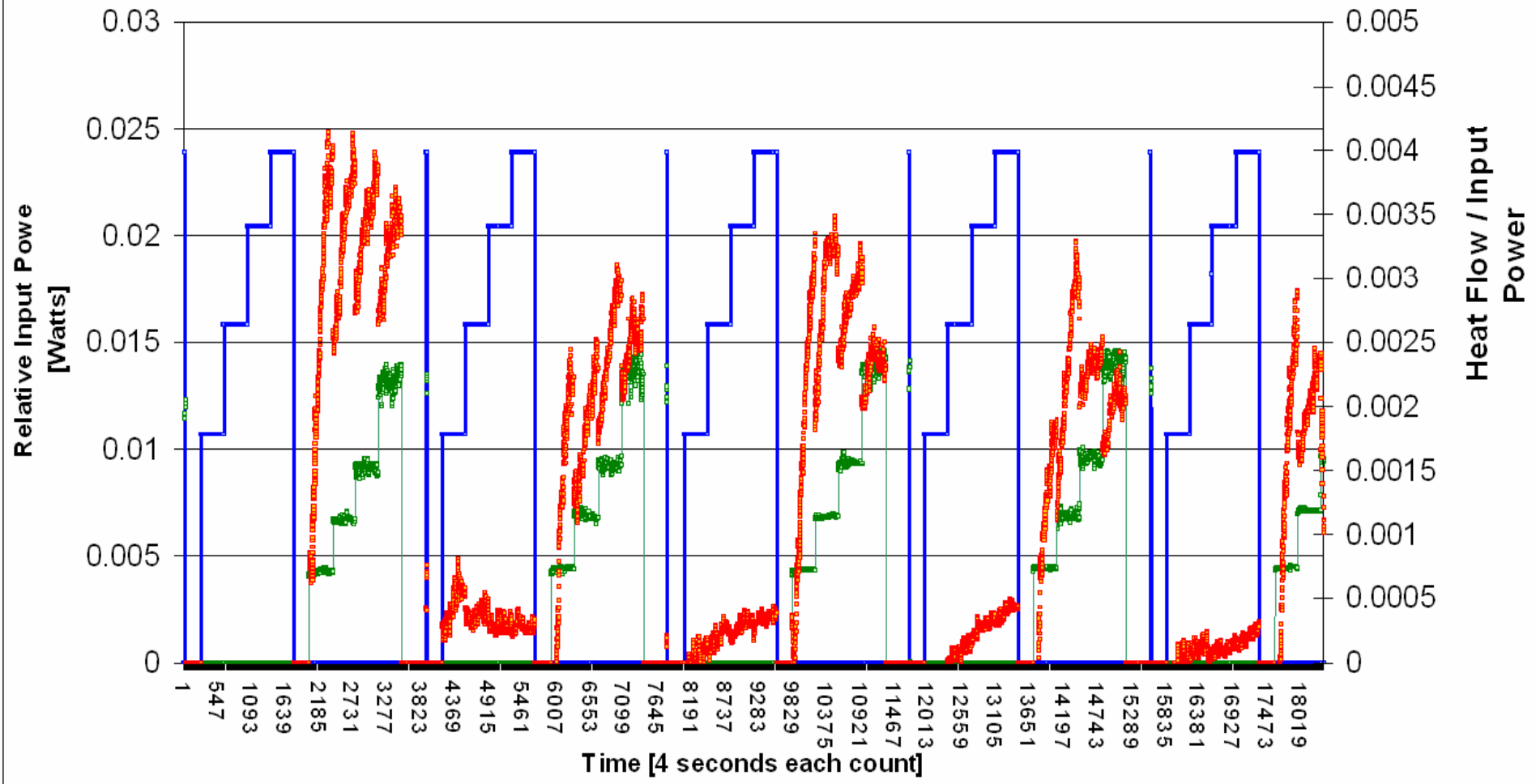
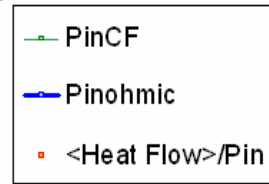
delta T and Input Power
JET Energy, Inc. Driving Calorimeter and NANOR Series 6 VI-33ACL131C2
Run EJan30C - Dr. M. Swartz at MIT DEMO and IAP Course 1/31/2012



delta T (Normalized to Input power) and Input Power
JET Energy, Inc. Driving Calorimeter and NANOR
Series 6 VI-33ACL131C2 Run EJan30C -
MIT IAP CF/LANR Course - Dr. M. Swartz 1/30/2012



HEAT FLOW (Normalized to Input power) and Input Power
JET Energy, Inc. Driving Calorimeter and NANOR
Series 6 VI-33ACL131C2 Run EJan30C -
MIT IAP CF/LANR Course - Dr. M. Swartz 1/30/2012



EXCESS HEAT IN NANORS™

NANOR VI-33ACL131C2 EJ31A

(2nd day of open NANOR Demonstration)

Power Gain Determination by:

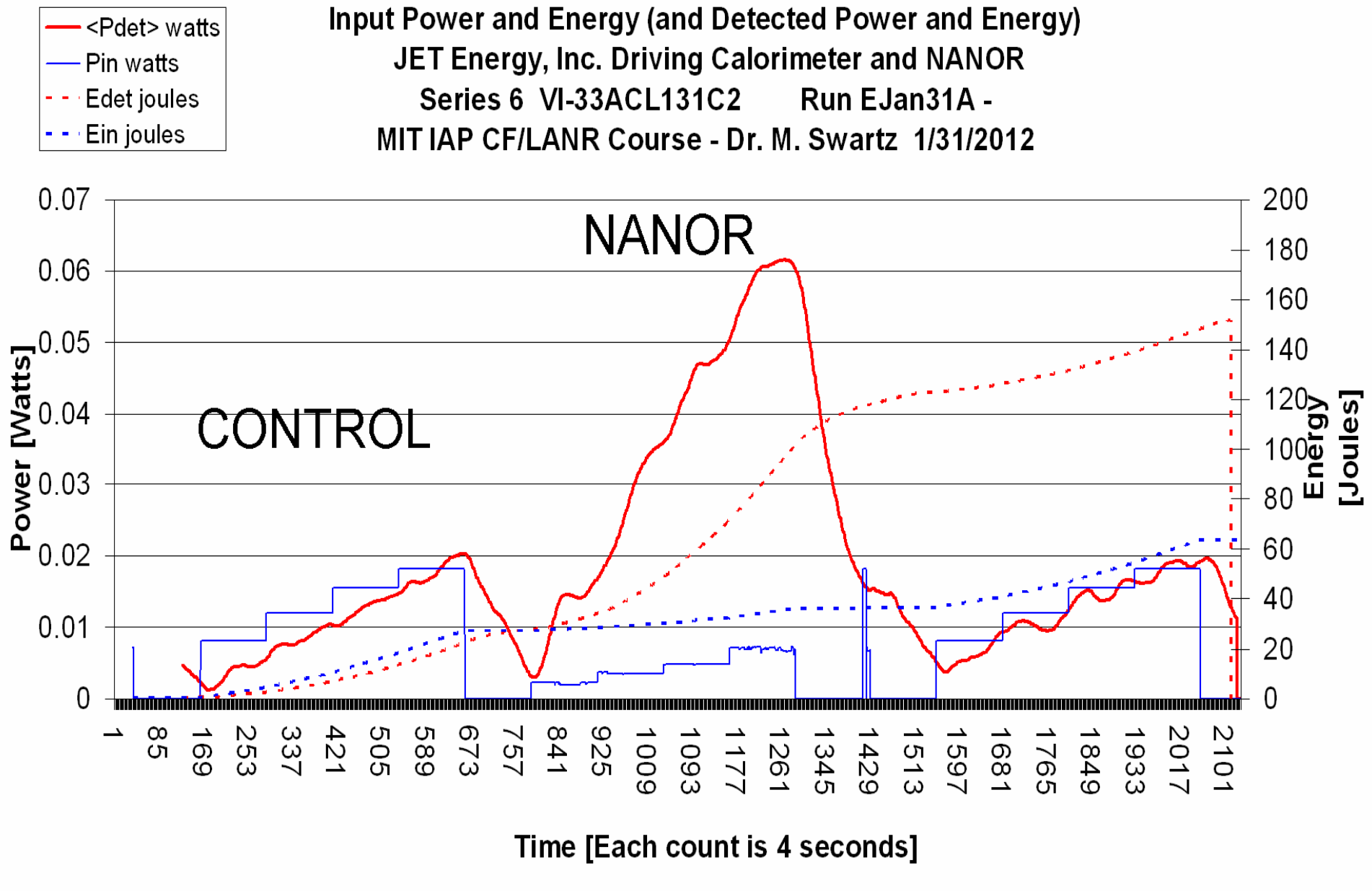
- dT/P_{in} = 1149%
- HF/P_{in} = 735%
- Calorimetry = 879%

Energy Gain = 4.64

XSE = 26.88 J

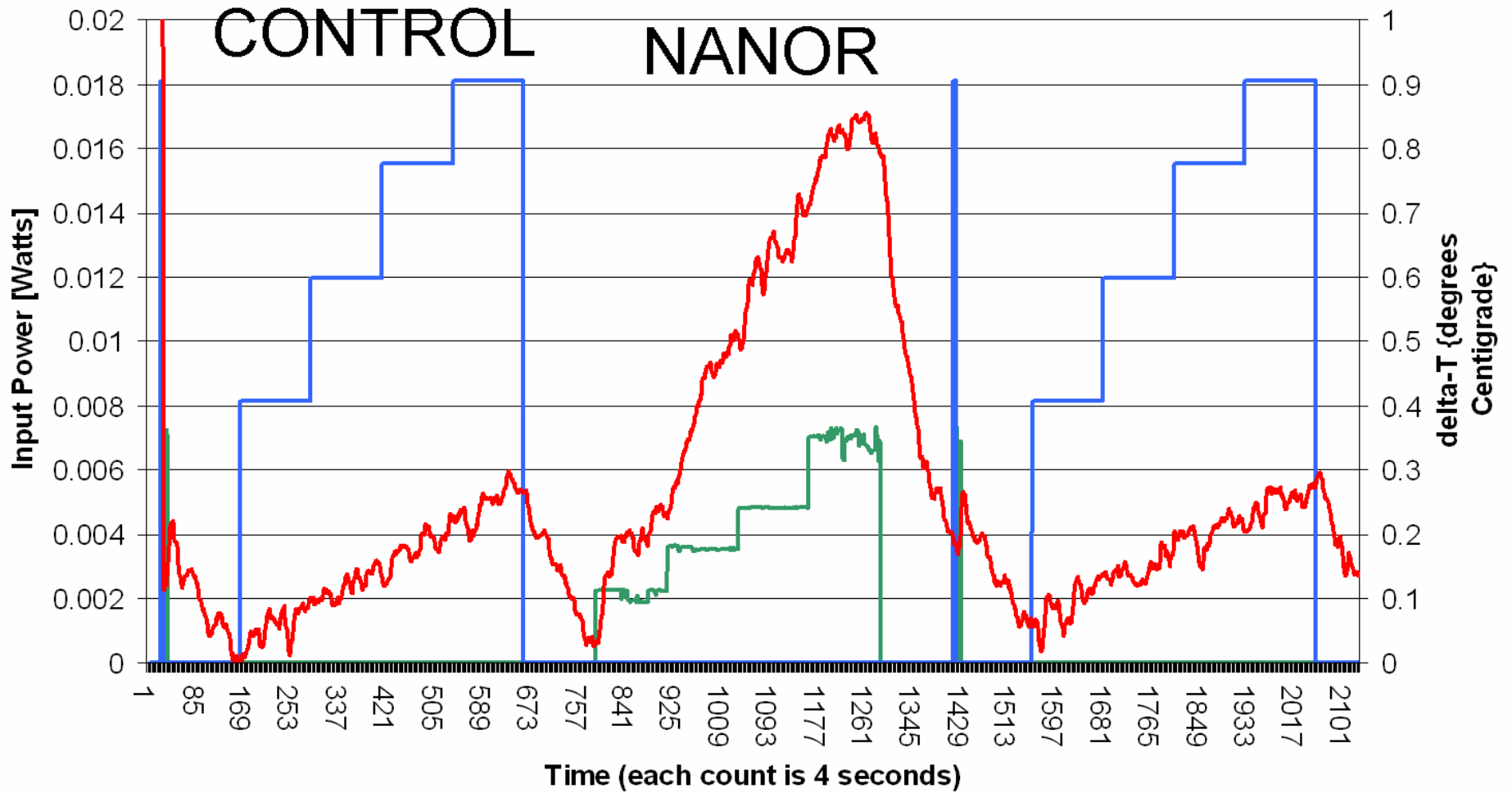
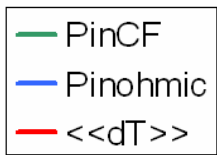


Input Power and Energy (and Detected Power and Energy)
JET Energy, Inc. Driving Calorimeter and NANOR
Series 6 VI-33ACL131C2 Run EJan31A -
MIT IAP CF/LANR Course - Dr. M. Swartz 1/31/2012

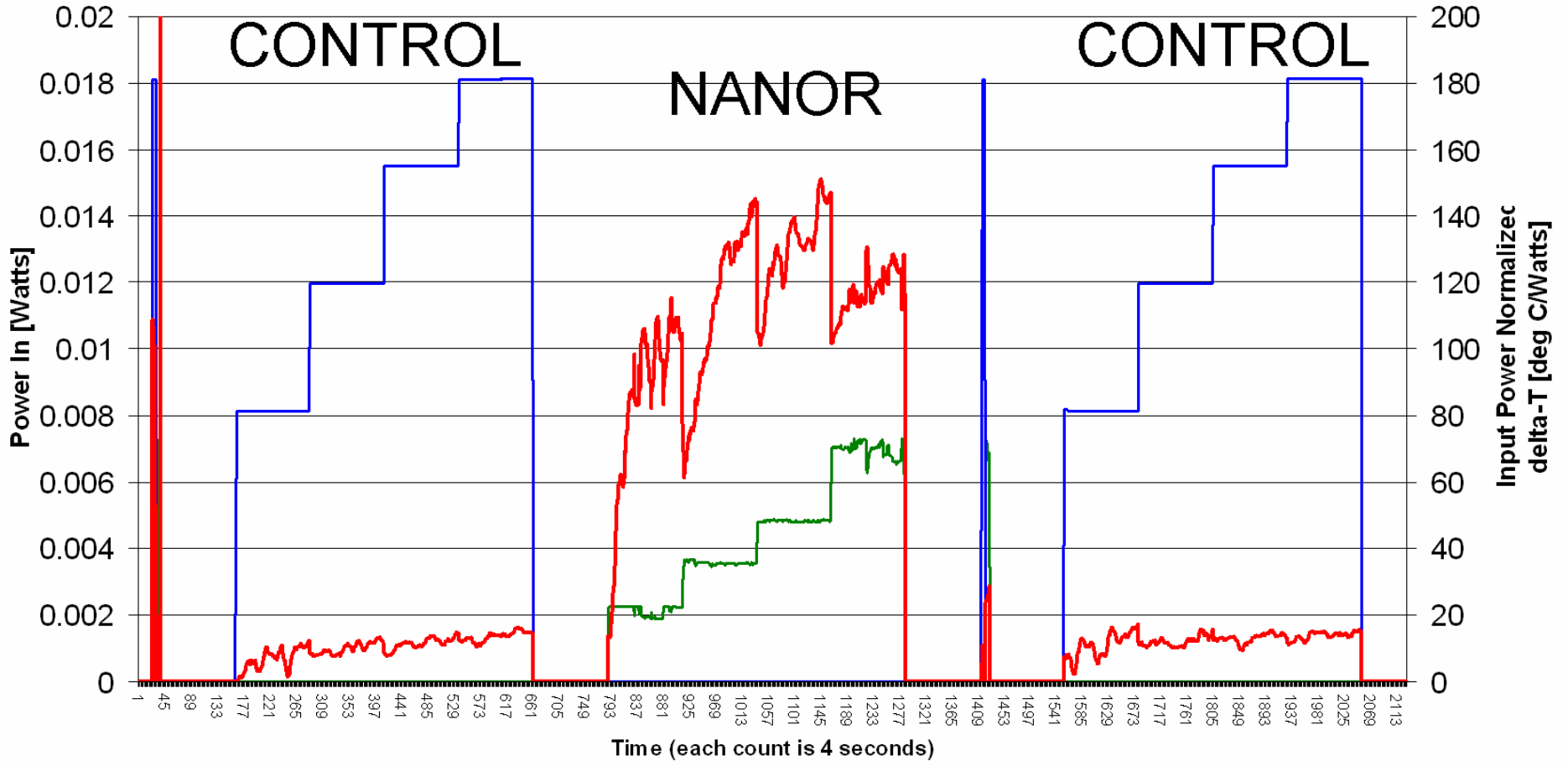
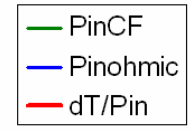


delta T and Input Power

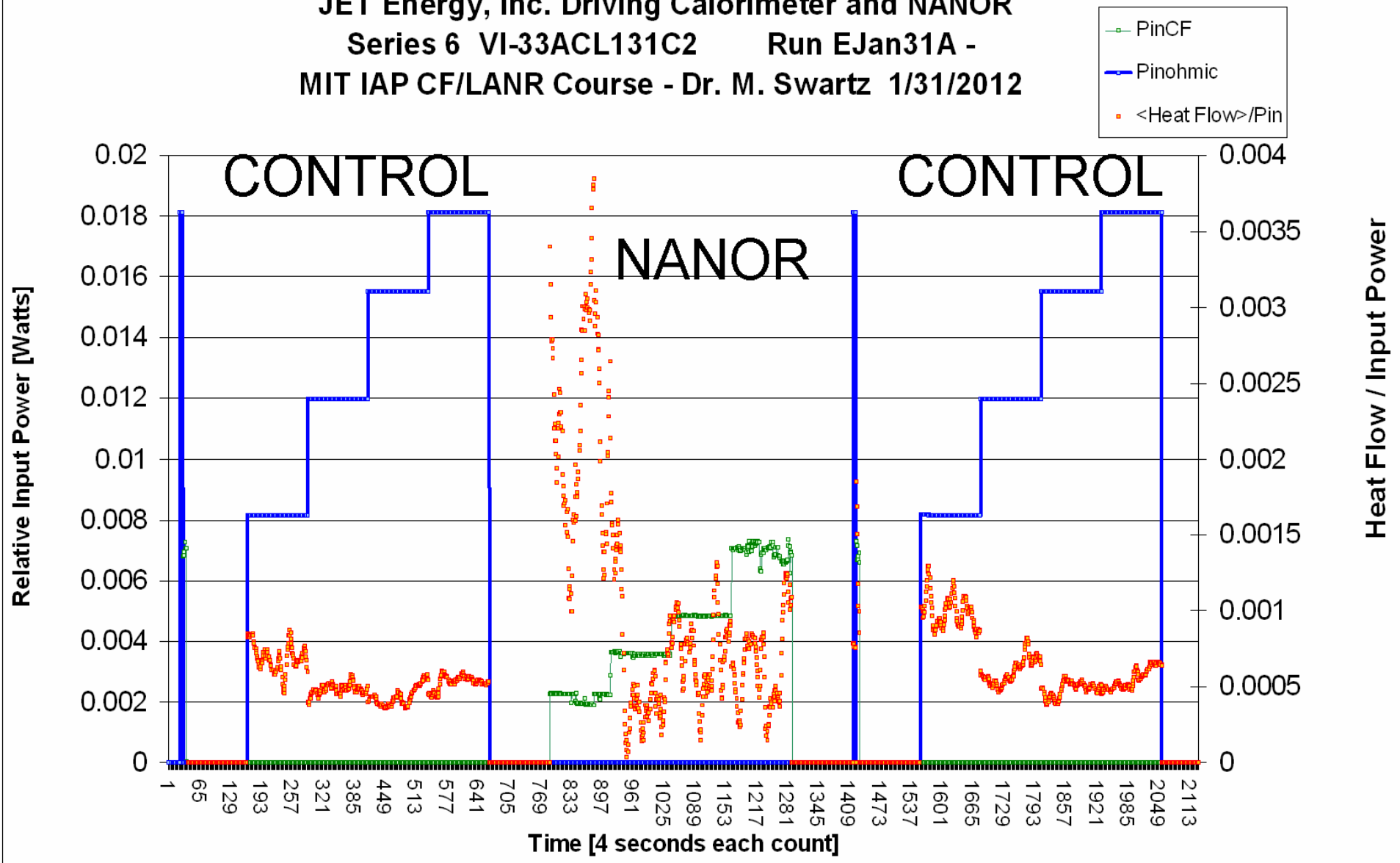
JET Energy, Inc. Driving Calorimeter and NANOR Series 6 VI-33ACL131C2
Run EJan31A - Dr. M. Swartz at MIT DEMO and IAP Course 1/31/2012



delta T (Normalized to Input power) and Input Power
 JET Energy, Inc. Driving Calorimeter and NANOR
 Series 6 VI-33ACL131C2 Run EJan31A -
 MIT IAP CF/LANR Course - Dr. M. Swartz 1/31/2012



HEAT FLOW (Normalized to Input power) and Input Power
JET Energy, Inc. Driving Calorimeter and NANOR
Series 6 VI-33ACL131C2 Run EJan31A -
MIT IAP CF/LANR Course - Dr. M. Swartz 1/31/2012



EXCESS HEAT IN NANORS™

NANOR VI-33ACL131C2 EJ31B

(2nd evening after Demo)

Peak Power Gain Determination by:

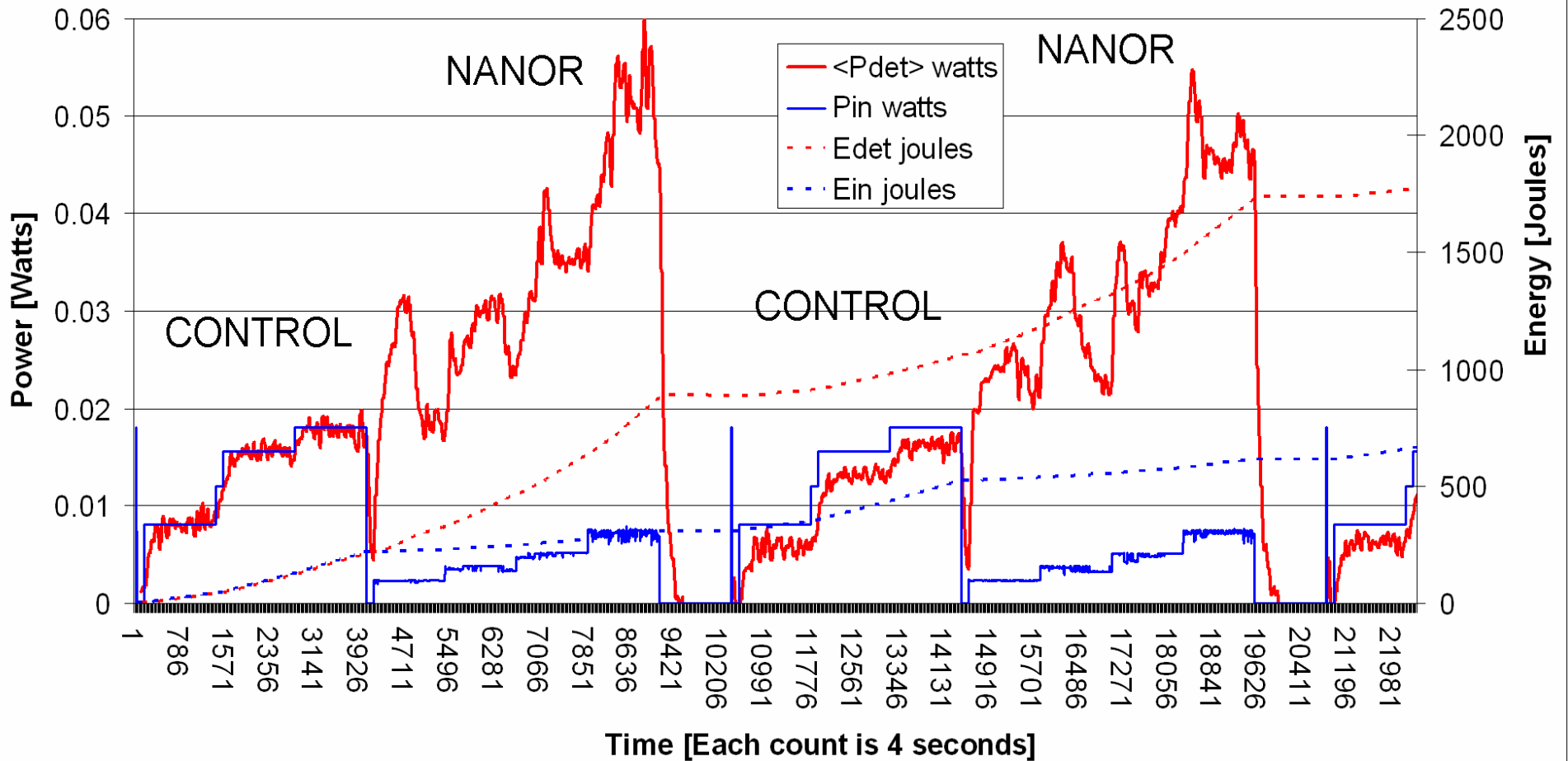
- $dT/P_{in} = 1291\%$
- $HF/P_{in} = 1549\%$
- $\text{Calorimetry} = 1398\%$

Energy Gain = 7.34

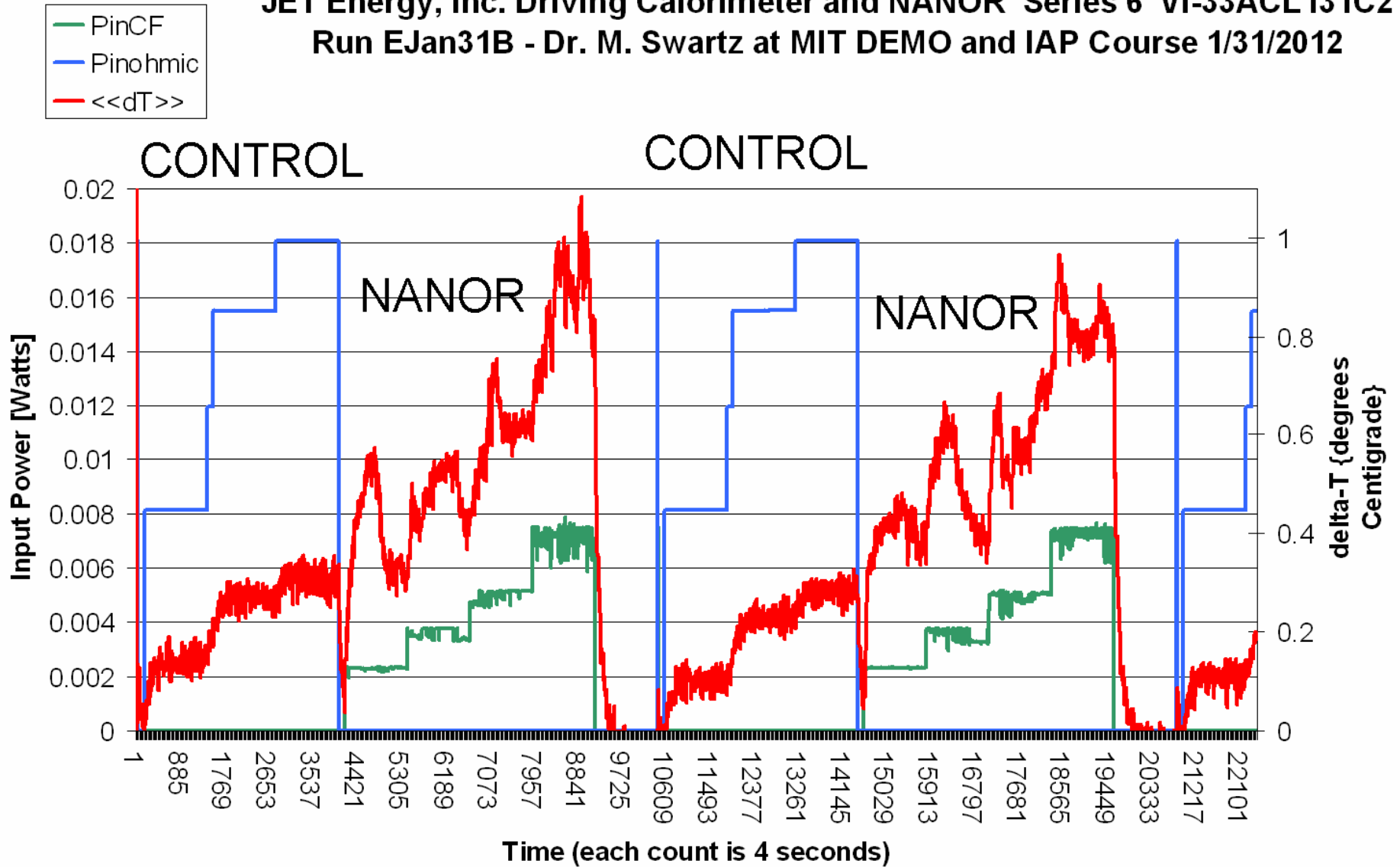
XSE = 1125.8 J



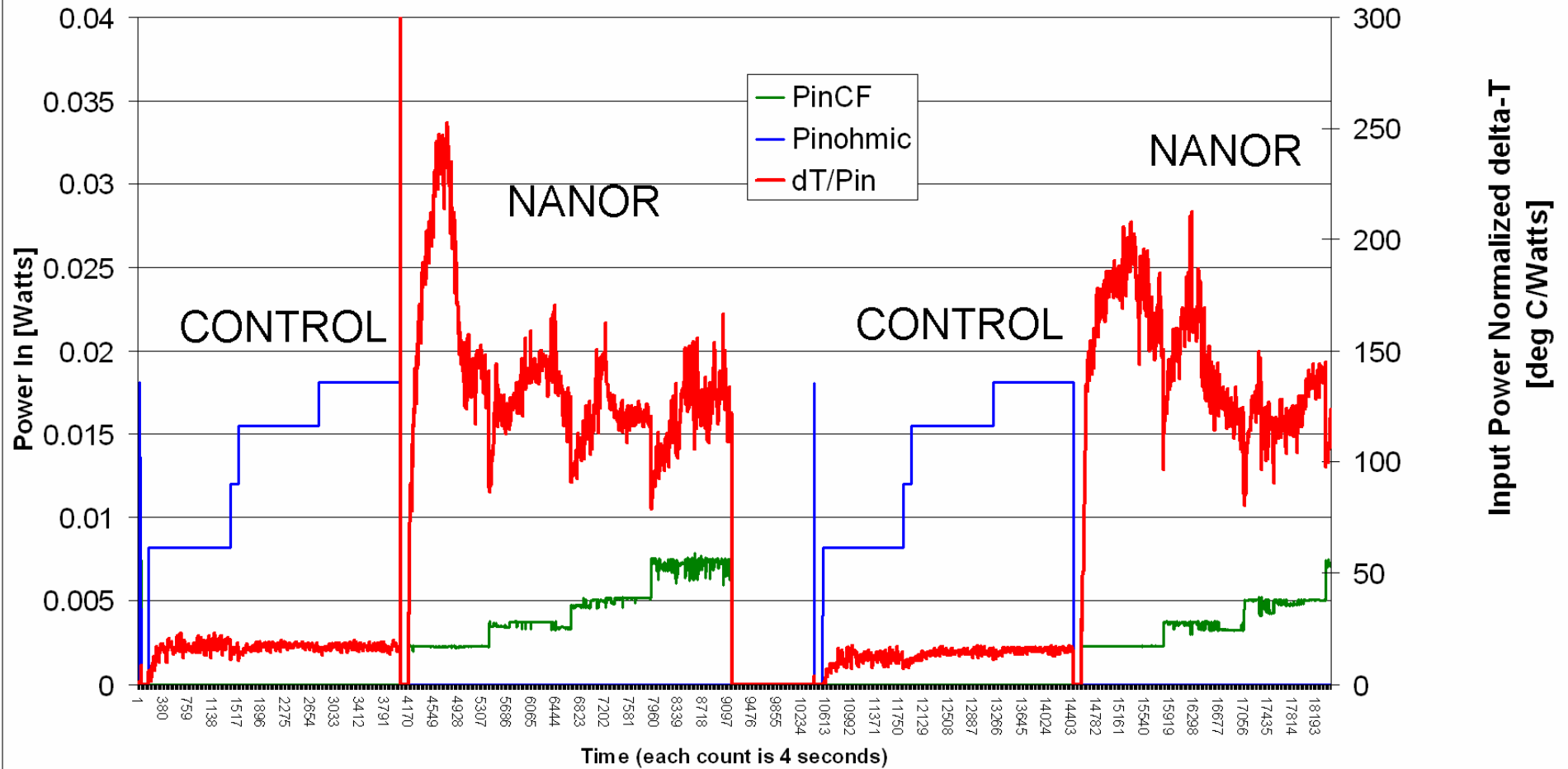
Input Power and Energy (and Detected Power and Energy)
JET Energy, Inc. Driving Calorimeter and NANOR
Series 6 VI-33ACL131C2 Run EJan31B - Dr. M. Swartz
MIT DEMO/IAP Course 1/31/2012



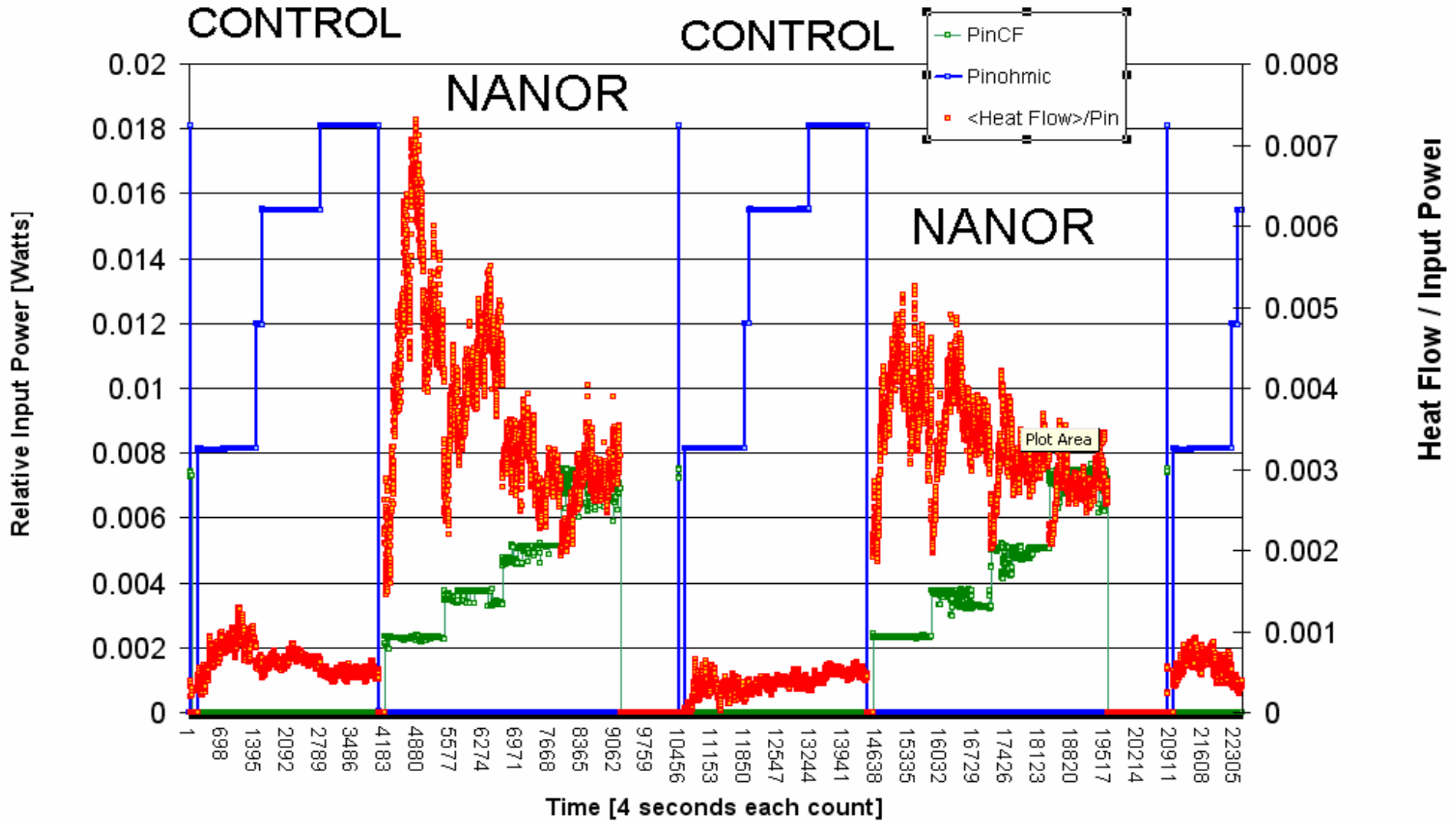
delta T and Input Power
JET Energy, Inc. Driving Calorimeter and NANOR Series 6 VI-33ACL131C2
Run EJan31B - Dr. M. Swartz at MIT DEMO and IAP Course 1/31/2012



**delta T (Normalized to Input power) and Input Power
JET Energy, Inc. Driving Calorimeter and NANOR
Series 6 VI-33ACL131C2 Run EJan31B - Dr. M. Swartz at MIT DEMO
and IAP Course 1/31/2012**



HEAT FLOW (Normalized to Input power) and Input Power
JET Energy, Inc. Driving Calorimeter and NANOR Series 6 VI-33ACL131C2
Run EJan31B - Dr. M. Swartz at MIT DEMO and IAP Course 1/31/2012



EXCESS HEAT IN NANORS™

NANOR VI-33ACL131C2 Run:EF01A

(2nd day after open NANOR Demonstration)

Peak Power Gain Determination by:

- $dT/P_{in} = 965 - 1370\%$
- $HF/P_{in} = 860 - 1250\%$
- $\text{Calorimetry} = 741 - 849\%$

Energy Gain = 7.40

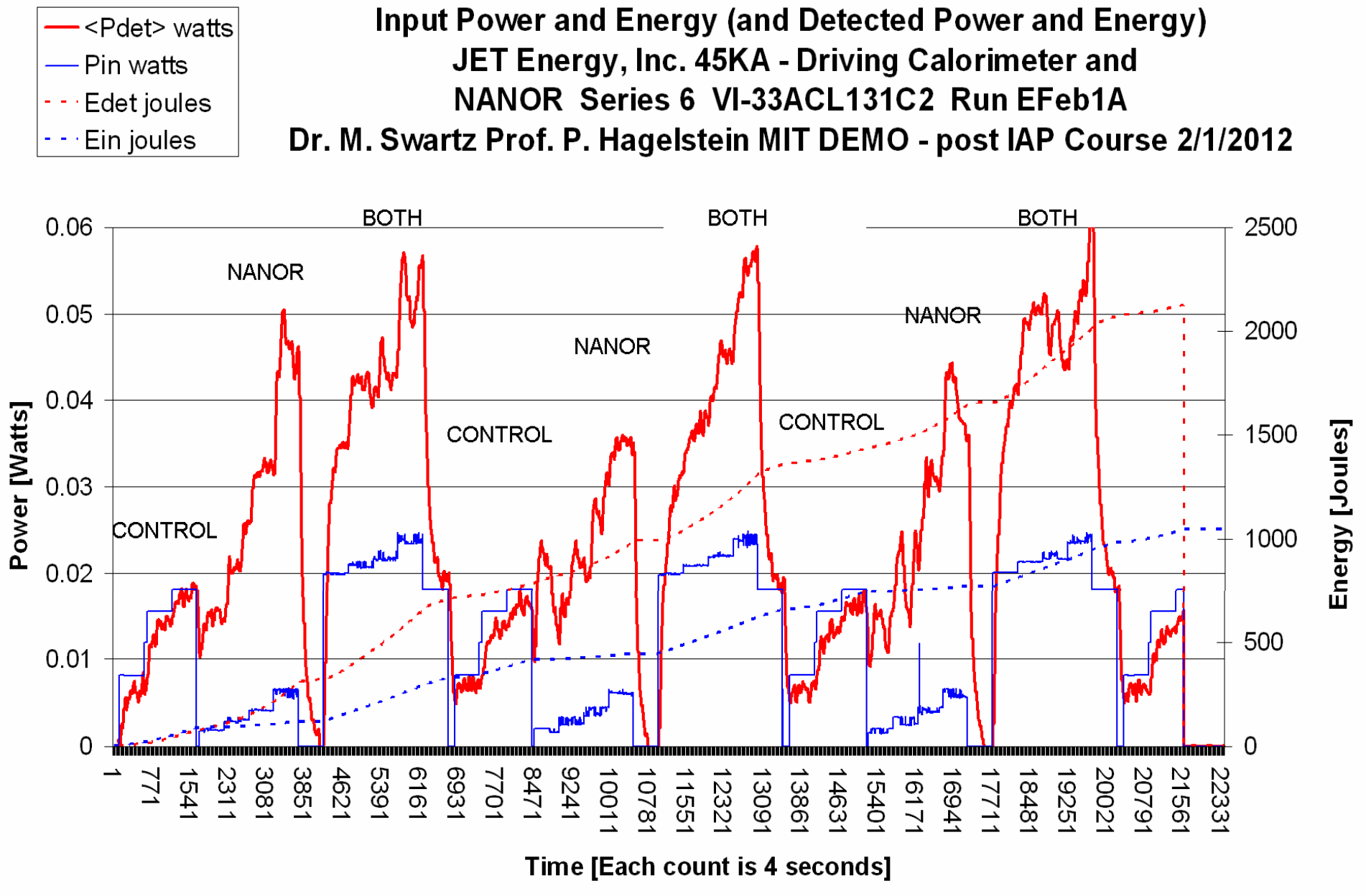
XSE = 199.4 J

Dr. Mitchell Swartz, Prof. Peter Hagelstein

MIT DEMO, post IAP CF/LANR Course 1/23-31/2012

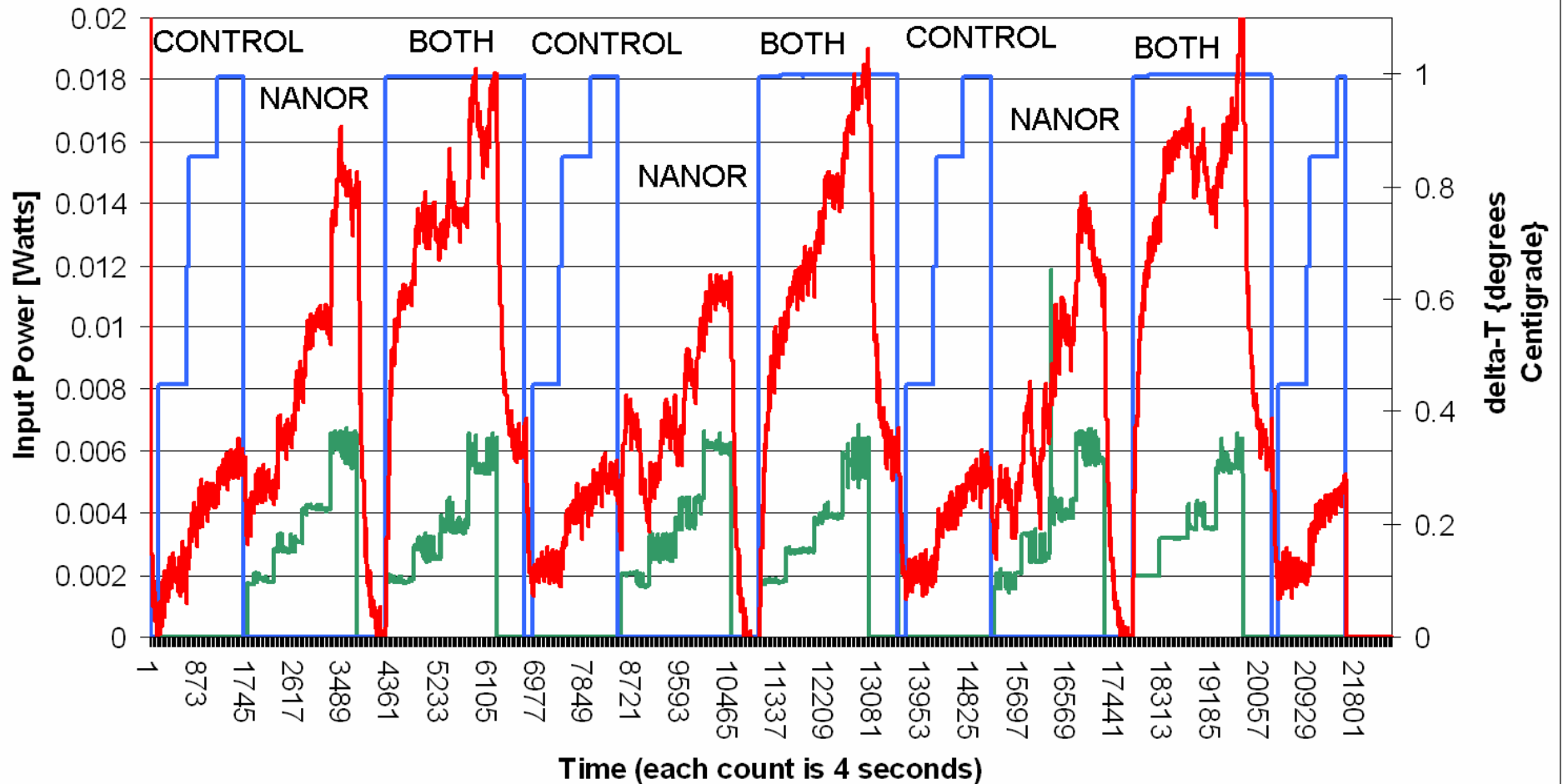


Input Power and Energy (and Detected Power and Energy)
JET Energy, Inc. 45KA - Driving Calorimeter and
NANOR Series 6 VI-33ACL131C2 Run EFeb1A
Dr. M. Swartz Prof. P. Hagelstein MIT DEMO - post IAP Course 2/1/2012



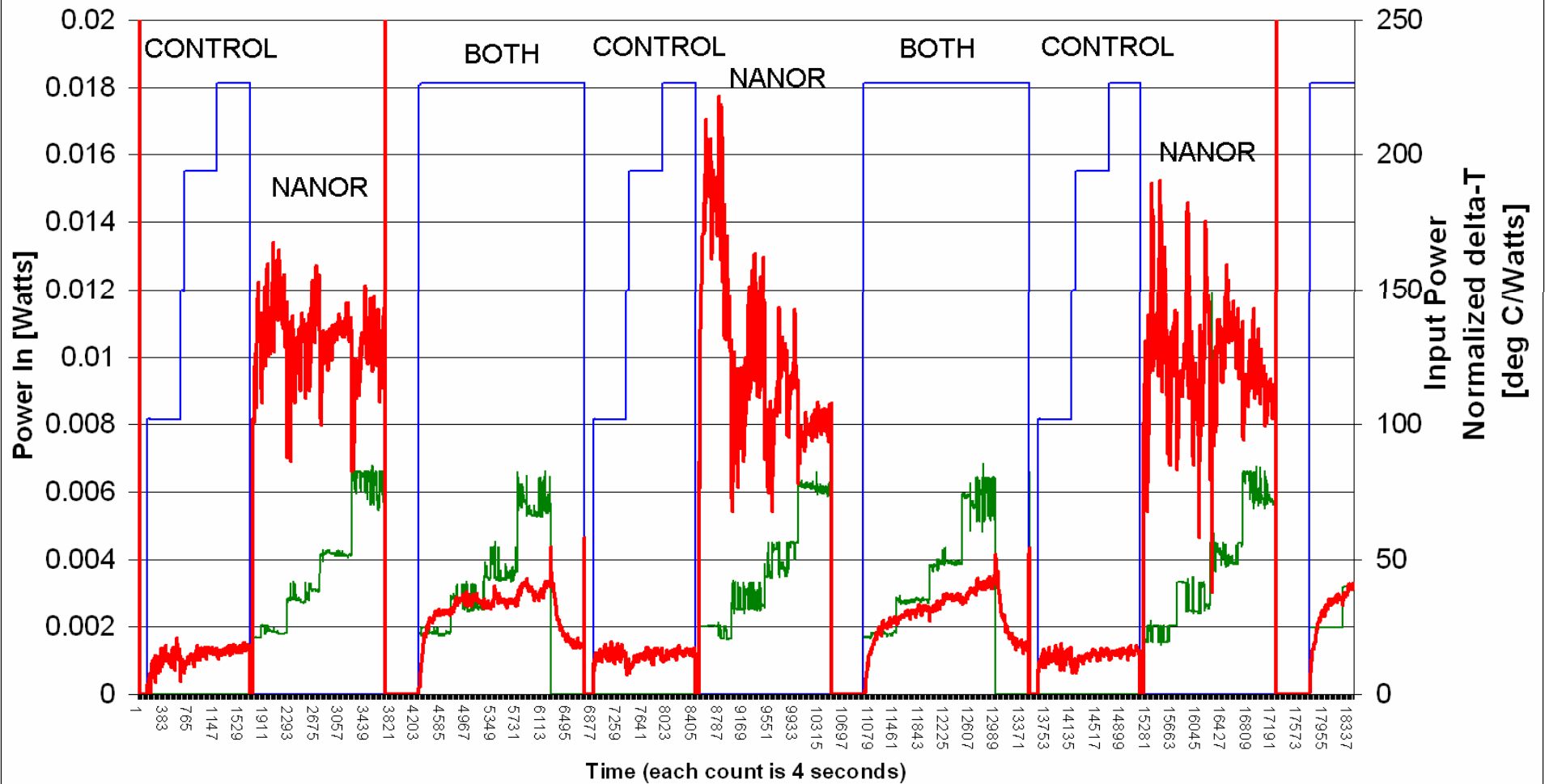
delta T and Input Power
JET Energy, Inc. 45KA - Driving Calorimeter and
NANOR Series 6 VI-33ACL131C2 Run EFeb1A

Dr. M. Swartz Prof. P. Hagelstein MIT DEMO - post IAP Course 2/1/2012



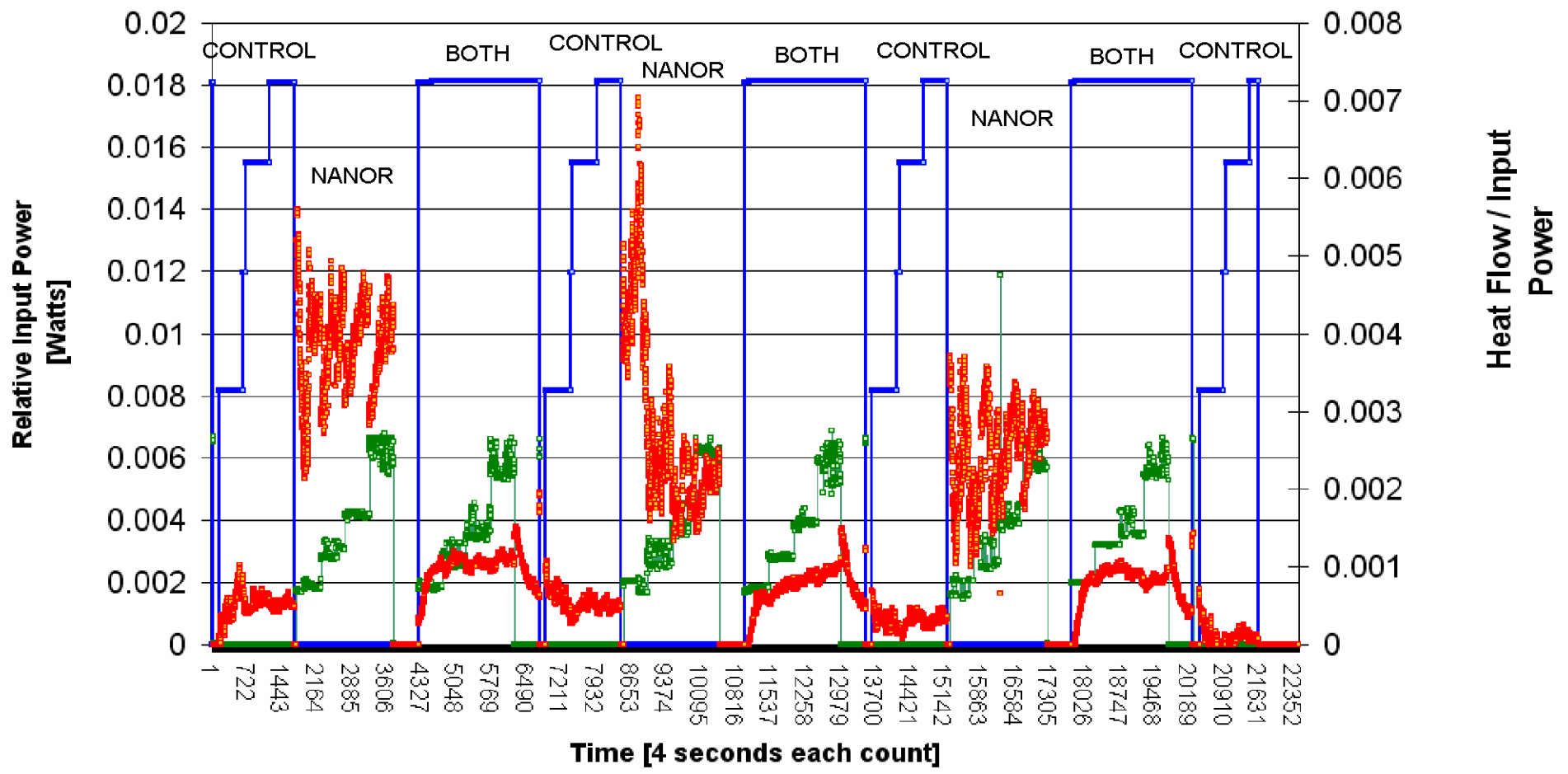
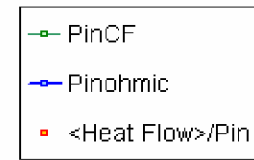
delta T (Normalized to Input power) and Input Power
JET Energy, Inc. 45KA - Driving Calorimeter and
NANOR Series 6 VI-33ACL131C2 Run EFeb1A

Dr. M. Swartz Prof. P. Hagelstein MIT DEMO - post IAP Course 2/1/2012



HEAT FLOW (Normalized to Input power) and Input Power JET Energy, Inc. 45KA - Driving Calorimeter and NANOR Series 6 VI-33ACL131C2 Run EFeb1A

Dr. M. Swartz Prof. P. Hagelstein MIT DEMO - post IAP Course 2/1/2012



INVESTIGATION OF EXCESS ENERGY In LANR ACTIVE NANOMATERIALS

- 1D NANORs of PdNiD-ZrO₂ and PdD-ZrO₂ nanostructured materials have demonstrated LANR (lattice assisted nuclear reaction) activity.
- 1D NANORS have been shown to have CF/LANR activity at the MIT/JET Energy open demonstrations at the IAP Course on Jan. 30 and 31, 2012 and during the next two months.

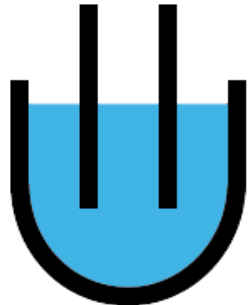


JET ENERGY, Inc.

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to Serve You”*



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2012 LANR/CF IAP Course at MIT
Cambridge MA, January 23-31, 2012



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