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

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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.
Input electrical power defined as $V^*I$.

Input energy = time-integral ($V(t) * I(t)$).

The excess energy is defined and derived as time integral of $[P_{output}(t) - P_{input}(t)]$.

The instantaneous power amplification factor (non-dimensional) is defined as $P_{out}/P_{in}$, 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 \(\sim+/-0.5\%\)
Current accuracy: \(+/-1\%\)
Voltage, current, temperature, heat flux, generated elec.)
Nyquist sampling issue: \(>0.1 - 1\) 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:

- $dT/\text{Pin}$  input-power-corrected $dT$
- $HF/\text{Pin}$  input-power-corrected $dT$
- Time-integrated, ohmic control calibrated, waveform checked, calorimetry
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
Series 6 VI-33ACL131C2 Run EJan30B -
MIT IAP CF/LANR Course - Dr. M. Swartz 1/30/2012

![Graph showing delta T and Input Power for NANOR and CONTROL](image-url)
delta T (Normalized to Input power) and Input Power

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

CONTROL

NANOR

Time (each count is 4 seconds)
EXCESS HEAT IN NANORS™

NANOR VI-33ACL131C2 EJ30C
(evening after Demo)

Power Gain Determination by:
- dT/Pin = 1096%
- HF/Pin = 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

Power [Watts]

Energy [Joules]

Time [Each count is 4 seconds]
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

2012 LANR/CF IAP Course at MIT
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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:
- \( dT/\text{Pin} = 1149\% \)
- \( HF/\text{Pin} = 735\% \)
- Calorimetry = 879%

Energy Gain = 4.64          XSE = 26.88 J
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

CONTROL

NANOR

CONTROL

Power In [Watts]

0
0.002
0.004
0.006
0.008
0.01
0.012
0.014
0.016
0.018
0.02

0
20
40
60
80
100
120
140
160
180
200

Time (each count is 4 seconds)
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

2012 LANR/CF IAP Course at MIT
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EXCESS HEAT IN NANORS™

NANOR VI-33ACL131C2    EJ31B
(2nd evening after Demo)
Peak Power Gain Determination by:
- \( \frac{dT}{Pin} = 1291\% \)
- \( \frac{HF}{Pin} = 1549\% \)
- 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

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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

2012 LANR/CF IAP Course at MIT
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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

2012 LANR/CF IAP Course at MIT
EXCESS HEAT IN NANORS™

NANOR VI-33ACL131C2    Run:EF01A
(2nd day after open NANOR Demonstration)

Peak Power Gain Determination by:
- dT/Pin = 965 - 1370%
- HF/Pin = 860 - 1250%
- 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
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 nanosstructured 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.