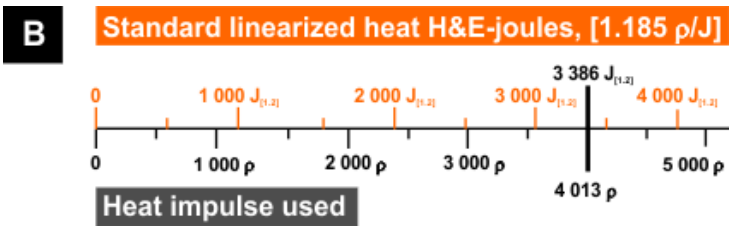

Linearized Vs. Multi-Parabolic Joules

Professor Du-Ane Du

www.Wacky1301SCI.com, *"Looking at serious science, sideways!"*

Three sisters, Pico, Hectii, and Tera, the "Space-sci Sherlocks," are traveling through the Asteroid Belt. Hectii discovers the differences between standard-linearized, multi-linear, and multi-parabolic joules.
—Excerpted from *Murdered Energy Mysteries*, Part 3, Chapter 8, by Du-Ane Du, (Amazon, Kindle, ebook 2018, paperback 2021).

"Chip, this is between you and me," Hectii whispered. She paused to watch the bars of the elevator frame glide upward past the elevator window. She felt like they were going down, but knew that the elevator was actually going outward—away from the center of the iota-shaped (Φ) Gravity Spa.

"What do you want to investigate?" Chip said.

"This strange business of multi-parabolic kinetic-joules$_{[IC]}$," Hectii said. "There must be rules of some sort. All forms of mathematics follow rules."

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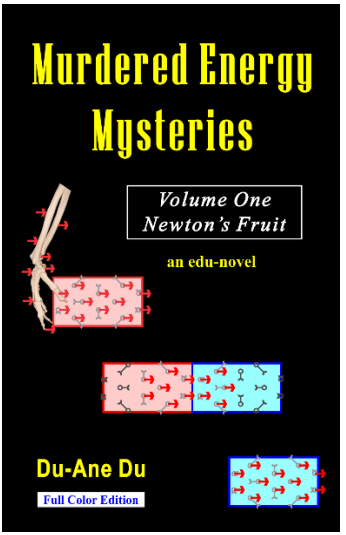

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Hectii stepped out of the elevator and entered the outer observation room. A dozen people were seated in front of the many large windows. Hectii sat in a deserted section of the room and watched a distant asteroid pass by a collection of stars.

"We keep finding strange answers whenever we use the energy equations," Hectii complained. "Grandpa Proge said, multi-parabolic kinetic-joules$_{[IC]}$ were developed as a math shortcut. Scientists used the shortcuts for hundreds of years. There must be secret rules that say when multi-parabolic kinetic-joules$_{[IC]}$ can be used, and when multi-parabolic kinetic-joules$_{[IC]}$ shouldn't be used."

"Where shall we begin?" Chip prompted.

"With imaginary numbers," Hectii said logically. "Imaginary numbers are defined as the square root of –1. The symbol is *i*, and the mathematical definition is, $i = \sqrt{-1}$. The

square root of –1 doesn't exist in nature, so imaginary numbers are mainly philosophical ideas. But there are lots of reasons why mathematicians study them.

"Imaginary numbers follow special rules," Hectii continued. "For example, I once saw a friend try to add $4 + \sqrt{-1}$ to produce the result $4\sqrt{-1}$."

"Which is wrong, of course," Chip said. "Please continue."

"And," Hectii said. "I once had another friend try to multiply $3 \times 2\sqrt{-2}$ to produce the result, $6\sqrt{-6}$."

"Which is also incorrect," Chip said. "I'm beginning to grasp your point. Imaginary numbers can be useful under certain circumstances, but you must understand the rules before you use them."

"Precisely my point," Hectii postulated. "Grandpa Proge said, multi-parabolic kinetic-joules$_{[IC]}$ involve math shortcuts. Maybe multi-parabolic kinetic-joules$_{[IC]}$ aren't real numbers, maybe they are a different kind of imaginary number. And perhaps we keep becoming confused because we're accidentally breaking the secret rules of multi-parabolic kinetic-joules$_{[IC]}$."

"Excellent points, all," Chip said.

"Speaking of rules,' Hectii said. "Remind me again of how we indicate a value involves multi-parabolic kinetic-joules$_{[IC]}$."

"Two options," Chip said. "According to the Education Reform Act of 2081, you can either place an equal-likely symbol (~) before the number, or you can follow the unit with a subscript denoting the impulse coefficient involved. The impulse coefficient method is much more precise."

"Sort of like the base of a logarithm?"

"More like the denominator of a fraction," Chip said, "think of the impulse coefficient as the average joule size. The impulse coefficient is used to prevent calculations that might violate the law of conservation of momentum. Scientists used to violate the law of conservation of momentum all the time, during calculations."

"Interesting," Hectii accepted.

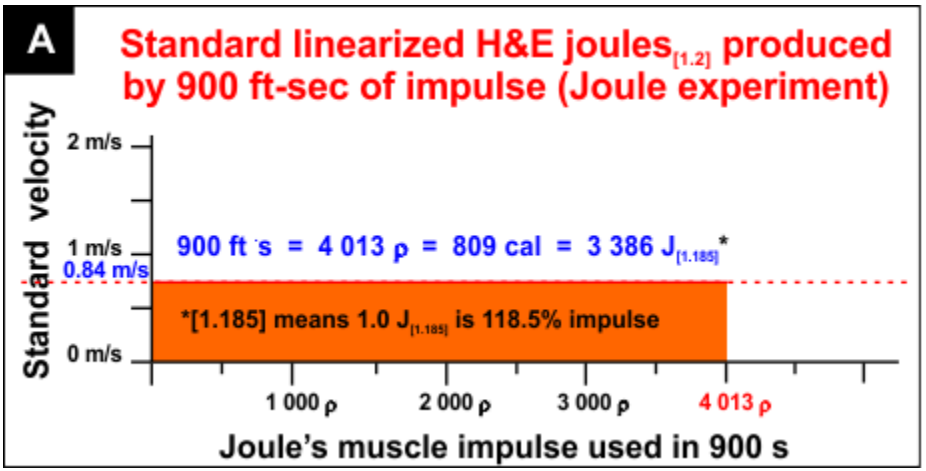
"How do we begin our investigation of the secret rules for multi-parabolic kinetic-joules$_{[IC]}$?"

"We begin with the James Prescott Joule's standardization experiment," Hectii said. "That seems to involve the simplest form of energy, and it has been standardized.

"Chip," Hectii said, "could you show me an impulse-produces-velocity graph of the 900 second experiment that Joule did. You know, he heated water by turning a hand crank

with a force of 1 lb for 900 s… what's the metric equivalent to 900 foot-seconds?"

"Here," Chip said, "900 foot-seconds is about 4 013 ρ of impulse."



"So according to this table, Joule used an effective speed of 0.84 m/s," Hectii extrapolated.

"More importantly, he used a joule production rate of 0.84 J/ρ," Chip said.

"Wait, let me double check that," Hectii cautioned. "A joule is (kg)(m/s)(m/s), and that's divided by ρ = (kg)(m/s)… you're right Chip, things cancel out so that:

$$\frac{J}{\rho} = \frac{kg(m/s)(m/s)}{kg(m/s)} = \frac{m}{s}$$

"See? The joule production rate is the same thing as the average speed!" Hectii said.

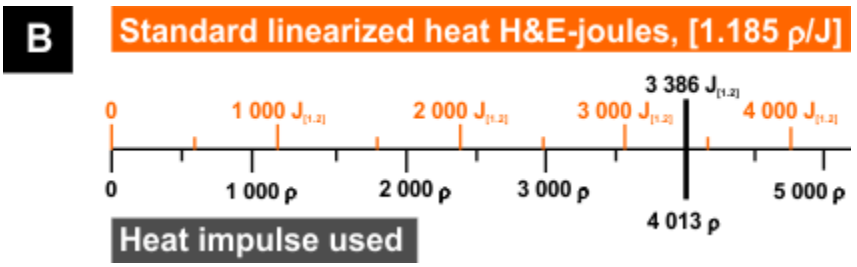
"You will also find that the joule production rate is the inverse of the impulse coefficient," Chip said. "Which is why the impulse coefficient doesn't include units."

"Back to the experiment," Hectii said. "Grandpa told us James Prescott Joule was trying to establish a mathematical connection between Heat calories & Electric joules, I guess you could call it the H&E-joule$_{[1.2]}$ connection. Was that connection ever established."

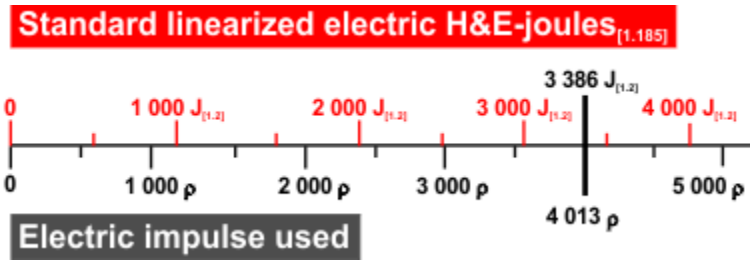
"Yes, there is a H&E-joule$_{[1.2]}$ connection," Chip said. "The same connection exists between electric-heat, chemical-heat, light-heat, and nuclear-heat."

"I'd like to visualize that, but I'm bothered by the last graph," Hectii said. "The impulse data is presented as a line graph, but the joules$_{[1.2]}$ data is in two dimensions, can it all be presented as line graphs?"

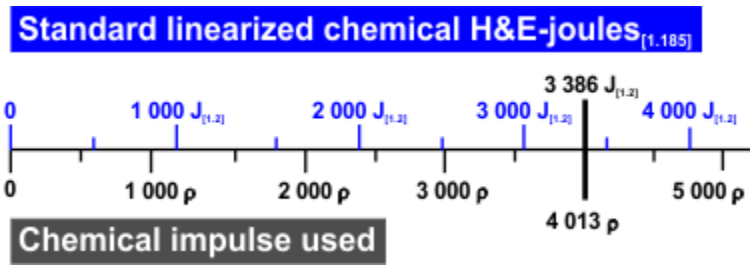
"Certainly, here are line graphs of all five relationships."



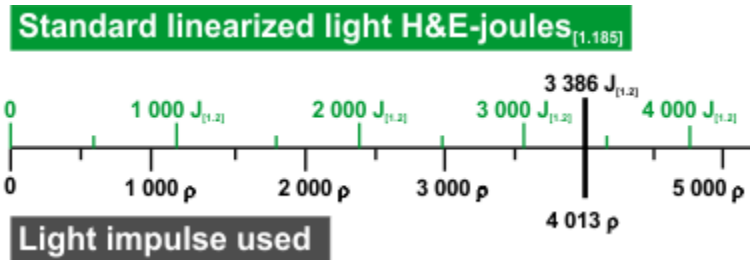
"Interesting," Hectii observed, "the joule$_{[1.2]}$ graph, on top, has an average tick size of 1.185 ρ/J, and the joule production rate is $\frac{1}{[1.185]}$, or 0.84 J/ρ."



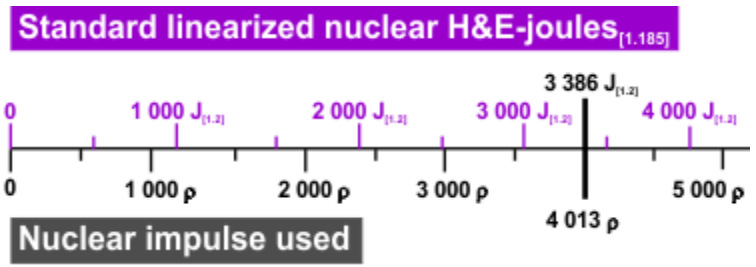
"Identical to the previous graph, with an average tick size of 1.185 ρ/J and a joule conversion rate of $\frac{1}{[1.185]}$, or 0.84 J/ρ."



"Chemical H&E-joules$_{[1.2]}$ match, too. They have an average tick size of 1.185 ρ/J and a joule conversion rate of $\frac{1}{[1.185]}$, or 0.84 J/ρ. I like the abbreviated impulse coefficient [1.2] the best."



"So far, they're all the same. An average tick size of 1.185 ρ/J and a joule conversion rate of $\frac{1}{[1.185]}$, or 0.84 J/ρ."



"This one matches too," Hectii proclaimed. "This means standard linear H&E-joules[1.2] are an exact multiple of impulse."

"And impulse is a measure of the transfer of momentum from one place to another," Chip said.

"Which means H&E-joules[1.2] are an exact multiple of momentum transfer," Hectii deduced. "Wow, we've discovered a secret, secret fact. You can't share this with Pico or Terra."

"I won't," Chip said, "and what's the secret?"

"The secret is our **standardization fact #1 of H&E-joule$_{[1.2]}$ conservation**," Hectii explained. "Standard linearized [Heat & Electric] H&E-joules$_{[1.2]}$ are a multiple of momentum transfer. Therefore, the law of conservation for momentum extends to cover all standard linear H&E-joules$_{[1.2]}$.

"Nuclear H&E-joules$_{[1.2]}$ and light H&E-joules$_{[1.2]}$ are an indirect measure of momentum-transfer, as are chemical H&E-joules$_{[1.2]}$, electric H&E-joules$_{[1.2]}$, and heat H&E-joules$_{[1.2]}$. H&E-joules$_{[1.2]}$ cannot be created or destroyed, because they are really measurements of momentum transfer."

"Quite a secret law," Chip said. "Are you certain they can be added and subtracted?"

"Absolutely," Hectii predicted, "I'll add 4 000 chemical to 4 000 light, see:"

$$4\,000\,J_{[1.2]} + 4\,000\,J_{[1.2]} \;\_?\_\; 8\,000\,J_{[1.2]}$$

"Yes, but how do you know this addition hasn't violated the law of conservation for momentum?"

"I guess… wait! That's what the impulse coefficient is for," Hectii said, excitedly. "To check the impulse/momentum data, like this:"

$$(4\,000)[1.185] + (4\,000)[1.185] \;\_?\_\; (8\,000)[1.185]$$
$$4\,740\,\rho + 4\,740\,\rho \;\_=\_\; 9\,480\,\rho \quad \textit{is true}$$

"See," Hectii said, "momentum has not been created or destroyed.

"Excellent," Chip said. "And you are correct, standard linearized H&E-joules$_{[1.2]}$ can be freely added and subtracted without violating the law of conservation for momentum."

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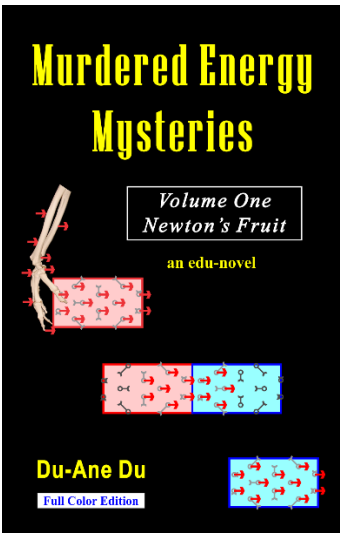

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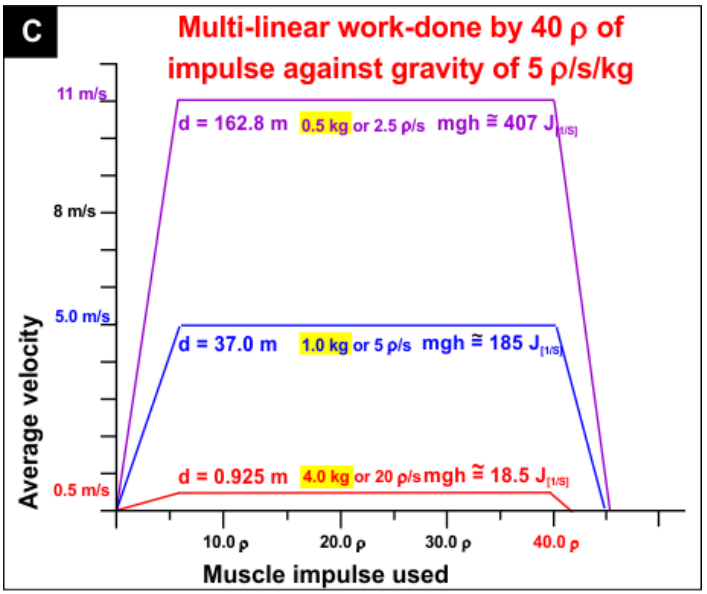
Hectii paused and looked out the window. A small shuttle was leaving the Gravity Spa's central hub. She wondered if they would find a way to go home before school started, or would Tera and their father go home without them, or would the girls decide to stay at the Gravity Spa together—for the entire school year? She wished there were another option.

"What's next?" Chip said, "you wanted to understand multi-parabolic kinetic-joules$_{[IC]}$."

"One step at a time," Hectii responded, pulling herself back to the subject at hand. "Now that I understand standard linearized H&E-joules$_{[1.2]}$, I want to look at non-standard multi-linear work-joules$_{[IC]}$. Chip, show me the impulse-produces-velocity graph for the weight-lifting experiment we did

a couple of weeks ago, you know where we pulled a rope and lifted bricks at different speeds. Show me the last graph."

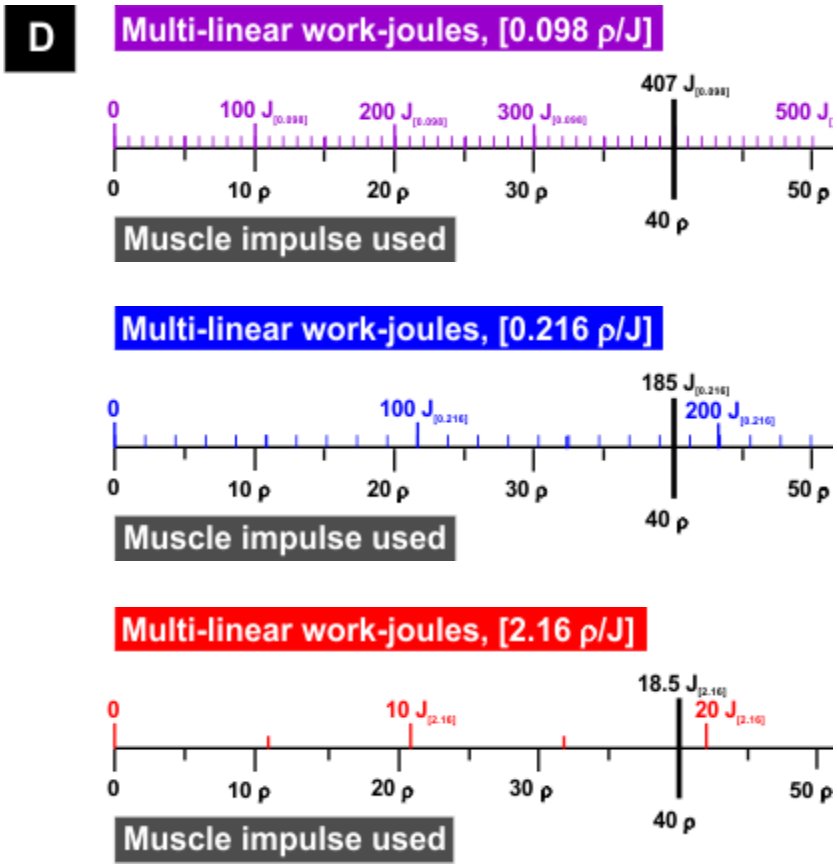
"Here it is."



"All of the experiments involved 40 ρ of impulse," Hectii said, "but the graphs clearly show they involved different joule production rates--that's why the graphs are different heights and they cover different areas.

"Let's examine the extremes more closely," Hectii continued, "Chip, show me a line graph version of all three experiments."

"Certainly," Chip said as the following appeared on the display:



"Beautiful," Hectii said. "Now it's clear these are *not* standard linearized H&E-joules[1.2], after all, the tick sizes are completely different."

"Can they be added together?"

"Clearly not," Hectii said. "Remember, you said the impulse coefficient is like the bottom of a fraction, the bottoms are different so the tops can't be added. Random adding of different size joules will produce an answer that violates the law of conservation of momentum!"

"Show me," Chip said. "By the way, for almost 200 years, scientists assumed that all joules were standard size, and they routinely added and subtracted work-joules$_{[IC]}$ and kinetic-joules$_{[IC]}$."

"That's crazy," Hectii muttered. "Watch, I'll add the purple data to the blue data, and I'll assume the answer is standard linearized H&E-joules$_{[1.2]}$."

$$\mathbf{407}\,J_{[0.098]} + \mathbf{185}\,J_{[0.216]} \;\_?\_\; 592\,J_{[1.2]}$$

"Now," Hectii said, "we check the impulse/momentum data, like this:"

$$(\mathbf{407})[\mathbf{0.098}] + (\mathbf{185})[\mathbf{0.216}] \;\_?\_\; (592)[1.185]$$
$$\mathbf{40}\,\rho + \mathbf{40}\,\rho \;\_?\_\; 701\,\rho \quad \textbf{\textit{momentum is created}}$$

"Not convinced?" Hectii said. "Let's add the purple data to the red data:"

$$\mathbf{407}\,J_{[0.098]} + \mathbf{18.5}\,J_{[2.16]} \;\_?\_\; 415.5\,J_{[1.2]}$$
$$(\mathbf{407})[\mathbf{0.098}] + (\mathbf{18.5})[\mathbf{2.16}] \;\_?\_\; (415.5)[1.185]$$
$$\mathbf{40}\,\rho + \mathbf{40}\,\rho \;\_?\_\; 492\,\rho \quad \textbf{\textit{momentum is created}}$$

"This is nuts," Hectii said sarcastically, "simple addition or simple subtraction of non-standard multi-linear work-joules$_{[IC]}$ is pure foolishness."

"Try adding the red data to itself," Chip said.

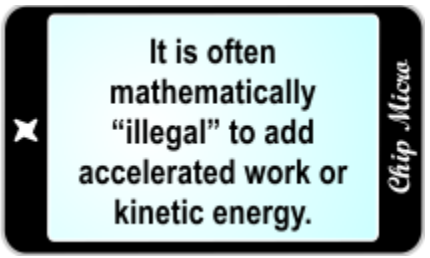
"That would be," Hectii said, as her fingers rapidly keyed:

$$\mathbf{18.5}\,\boldsymbol{J}_{\mathbf{[2.16]}} + \mathbf{18.5}\,\boldsymbol{J}_{\mathbf{[2.16]}} \;\_?\_\; 37\,J_{[1.2]}$$

$$(\mathbf{18.5})[\mathbf{2.16}] + (\mathbf{18.5})[\mathbf{2.16}] \;\_?\_\; (37)[1.185]$$

$$\mathbf{40}\,\boldsymbol{\rho} + \mathbf{40}\,\boldsymbol{\rho} \;\_?\_\; 43.8\,\rho \qquad \boldsymbol{momentum\ is\ destroyed}$$

"You know what," Hectii said, "we're looking at another standardization fact. Our super-secret **standardization fact #2 of non-standard addition** will say: The simple addition of non-standard joules$_{[IC]}$ often produces answers that violate the law of conservation for momentum. Simple subtraction of non-standard joules$_{[IC]}$ can also produce answers that violate the law of conservation of momentum.



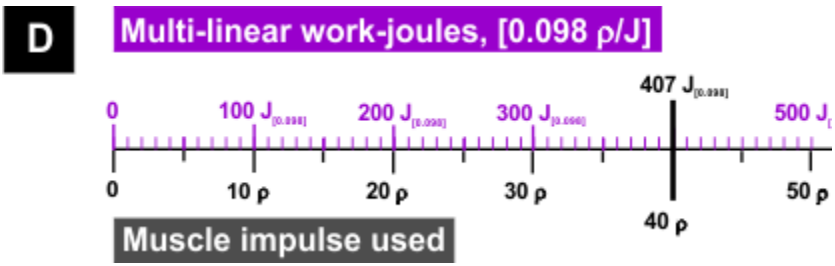
"When non-standard joule$_{[IC]}$ units are added or subtracted, the momentum involved must be calculated, the final momentum value is then divided by the final joules value to determine the new impulse coefficient [IC] for the final answer."

"Great," Chip said. "Are you getting a better feel for the impulse coefficient?"

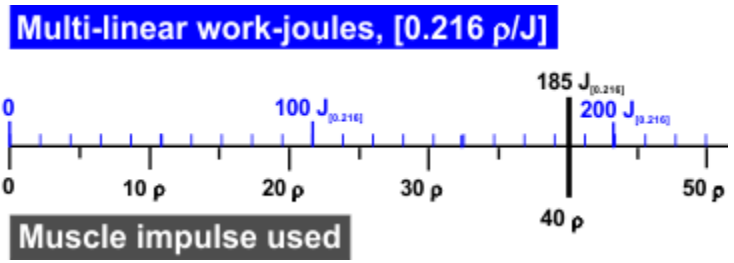
"Oh, and that's another secret scientific fact," Hectii said. "The **standardization fact #3 of mandatory impulse coefficients** says: failure to identify the impulse coefficient is an indirect violation of the law of conservation of momentum, because it encourages scientists to add or subtract non-standard joules$_{[IC]}$ units. This causes scientists to accidentally produce answers that violate the law of conservation for momentum."

"So what does the impulse coefficient mean?"

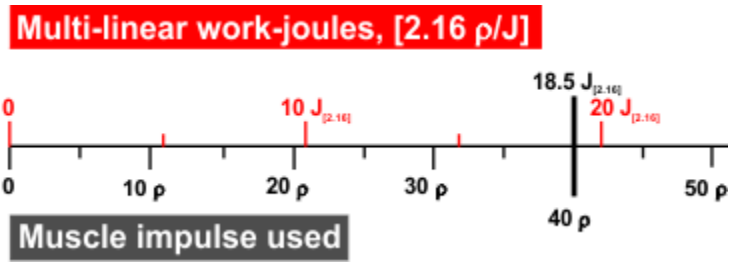
"We'll take it one illustration at a time," Hectii said as she tapped the touch screen and highlighted one graph at a time.



"Here the impulse coefficient is telling us the ticks are size [0.098]," Hectii said, "and 1.0 J$_{[0.098]}$ involves 9.8% impulse, and a joule production rate of $\frac{1}{[0.098]}$ or 10.2 J/ρ.



"This impulse coefficient tells us the ticks are size [0.216], and 1.0 $J_{[0.216]}$ involves 21.6% impulse, and a joule production rate of $\frac{1}{[0.216]}$ or 4.6 J/ρ.



"Now the impulse coefficient tells us the ticks are size [2.16], and 1.0 $J_{[2.16]}$ involves 216% impulse, and a joule production rate of $\frac{1}{[2.16]}$ or 0.46 J/ρ."

"Good," Chip said. "And you are correct when you said that simple addition and simple subtraction often violates the law of conservation for momentum."

CONCLUSION: More research needs to be done into the relationship between mechanical energy and other theoretical forms of energy. Many common beliefs may actually be philosophical myths.

Murdered Energy Mysteries seeks to increase understanding of the various forms of momentum and momentum transfer, as well as the various forms of energy and energy transfer. The lack of understanding on the part of the scientific community is substantial, and more research needs to be done.

—Du-Ane Du, author of the edu-novel *Murdered Energy Mysteries* (Amazon, Kindle, e-book 2018, paperback 2021.)

More information, see:
Murdered Energy Mysteries,
an edu-novel

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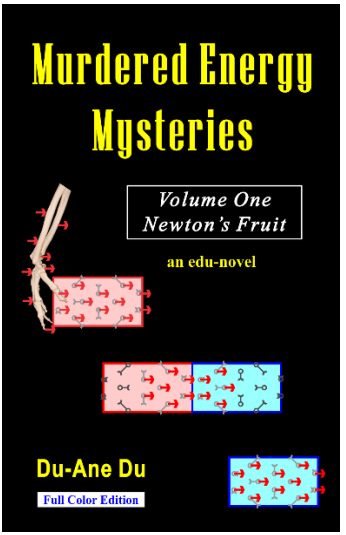

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