GRAVIMETRIC INDUCTIVE MASS FLUCTUATION

(MathCAD SIMULATION)

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The Inductive NEGISTOR

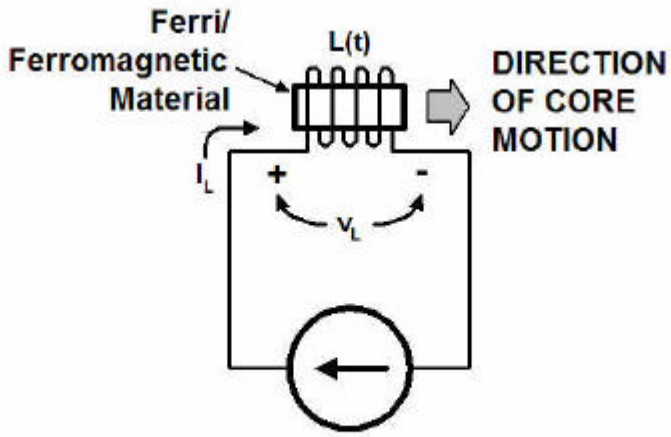

Figure 1. A fluctuating inductor L with Constant Current Source

Given:

$I := 0.5 \cdot amp$ $Lstart := 8.0 \cdot mH$

$Tstart := 0 \cdot sec$ $Tend := 1 \cdot sec$ $Tstep := 0.001 \cdot sec$

$t := Tstart, Tstep .. Tend$ $c := 2.9979 \cdot 10^{8} \cdot \frac{m}{sec}$ $g := 9.8 \cdot \frac{m}{sec^2}$

Motion Profile of Core Through Coil:

$$k(t) := 1 - \exp\left[\frac{\text{sec}}{-(t + 0.03\cdot\text{sec})\cdot 4}\right] \qquad K := 1 - \exp\left[\frac{\text{sec}}{-(\text{Tend} + 0.03\cdot\text{sec})\cdot 4}\right]$$

$$L(t) := \text{Lstart}\cdot k(t) \qquad \text{Lend} := \text{Lstart}\cdot K \qquad \text{Lend} = 0.001724\,\text{H}$$

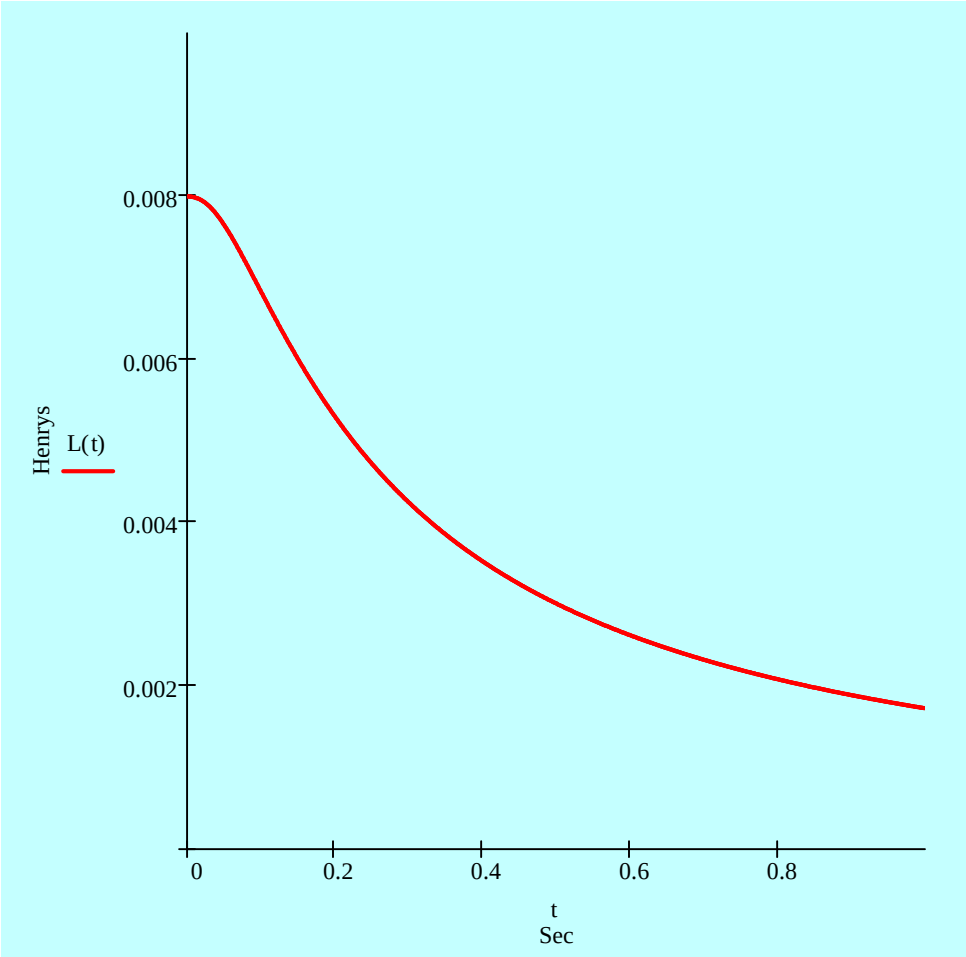

Figure 2. Ideal inductance vs. time

Compute Ideal Coil Gravimetric Resistance Term:

$$LDOT(t) := \frac{d}{dt} L(t)$$

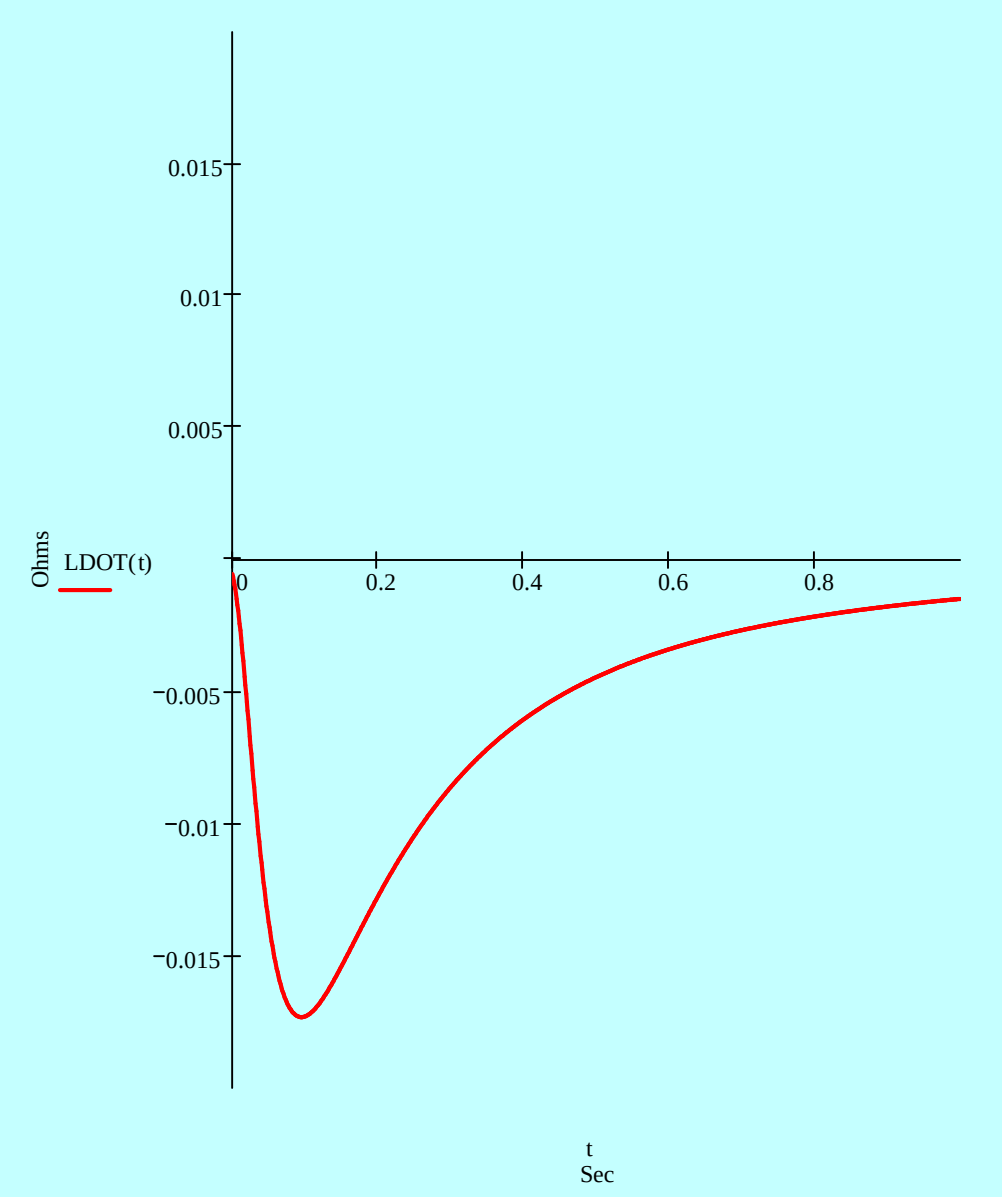

Figure 3. Ideal resistance vs. time

Compute Ideal Coil Gravimetric Voltage Term:

$v(t) := I \cdot LDOT(t)$

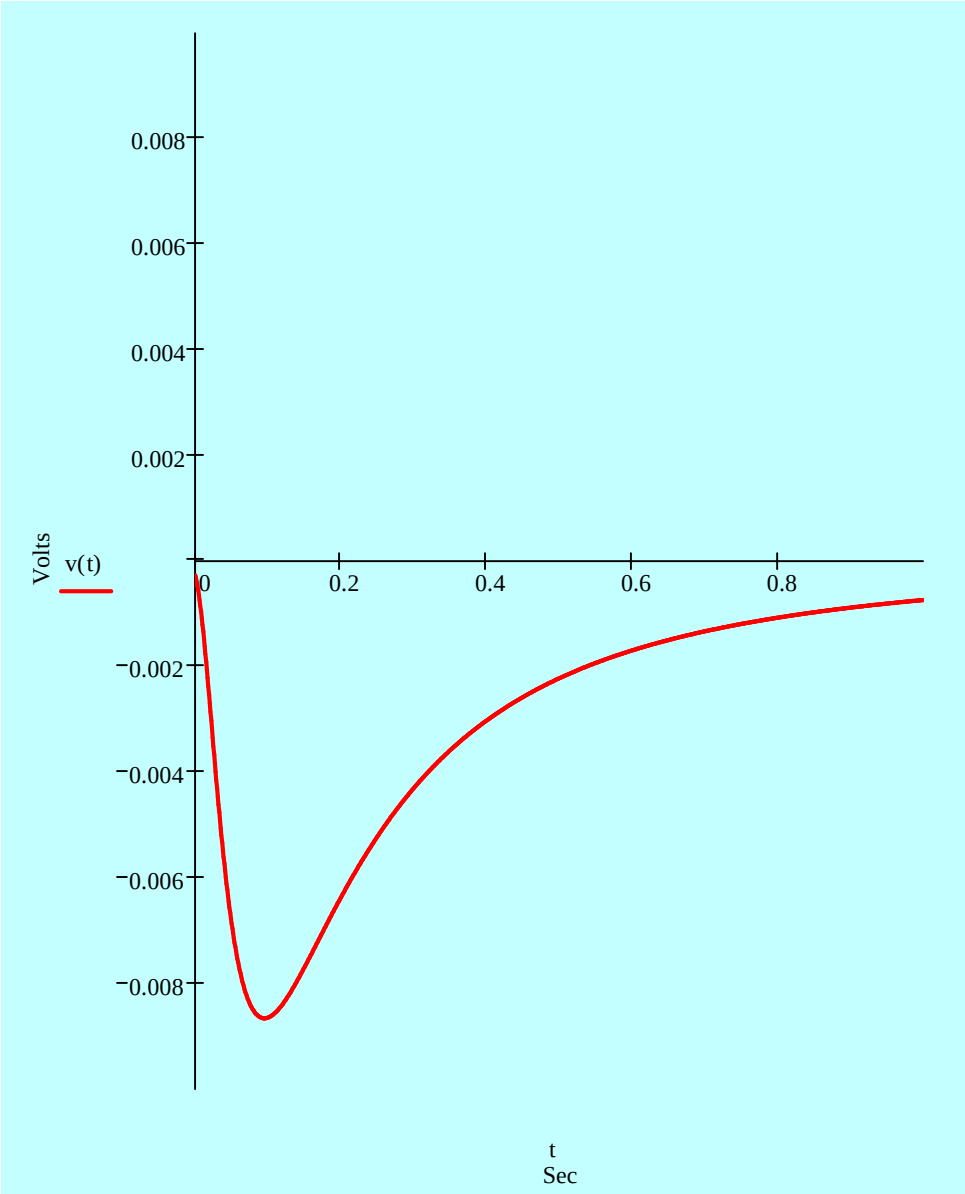

Figure 4. Ideal coil voltage vs. time

Compute Ideal Power Absorbed by Coil:

$P(t) := I \cdot v(t)$

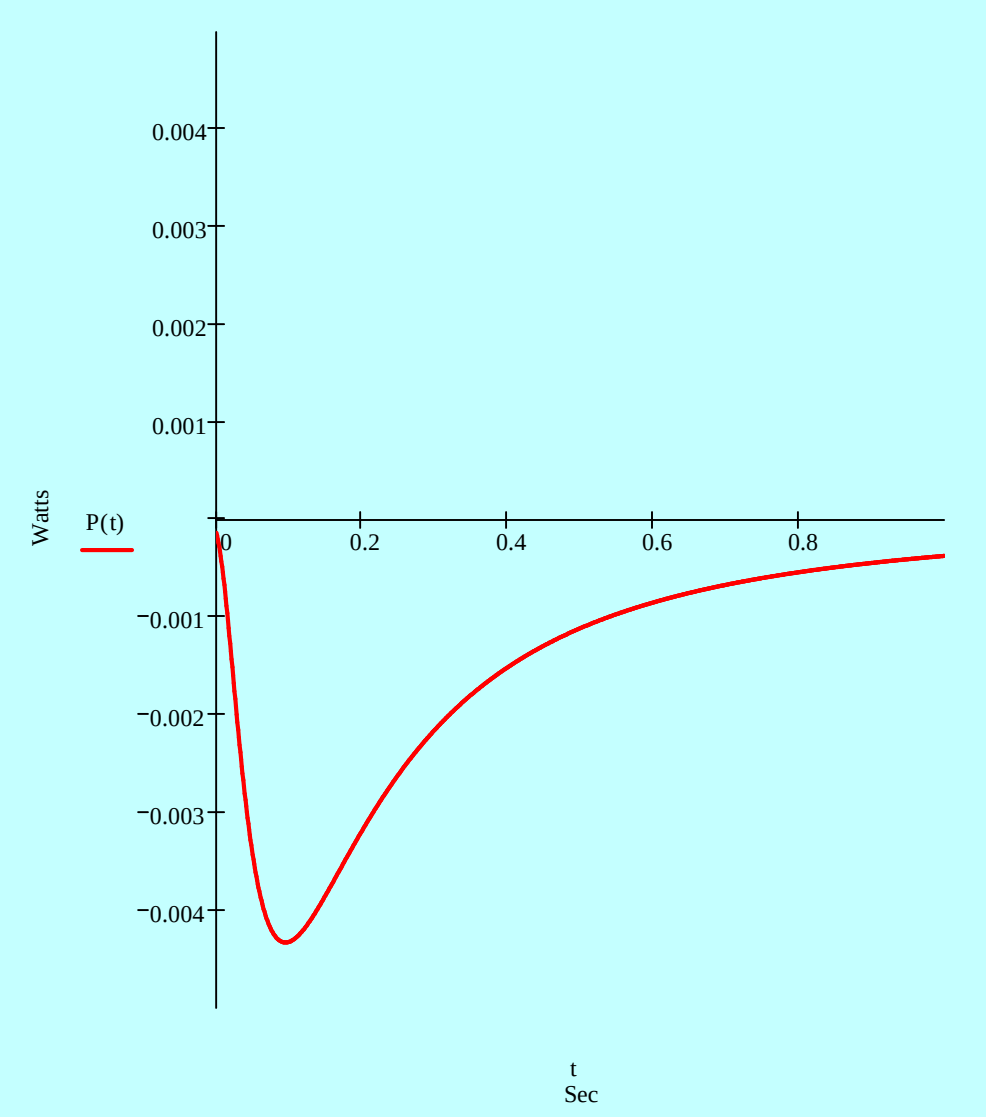

Figure 5. Ideal coil power vs. time

Compute Ideal Energy Stored in Coil:

$$E(t) := \int_{Tstart}^{t} P(t)\, dt$$

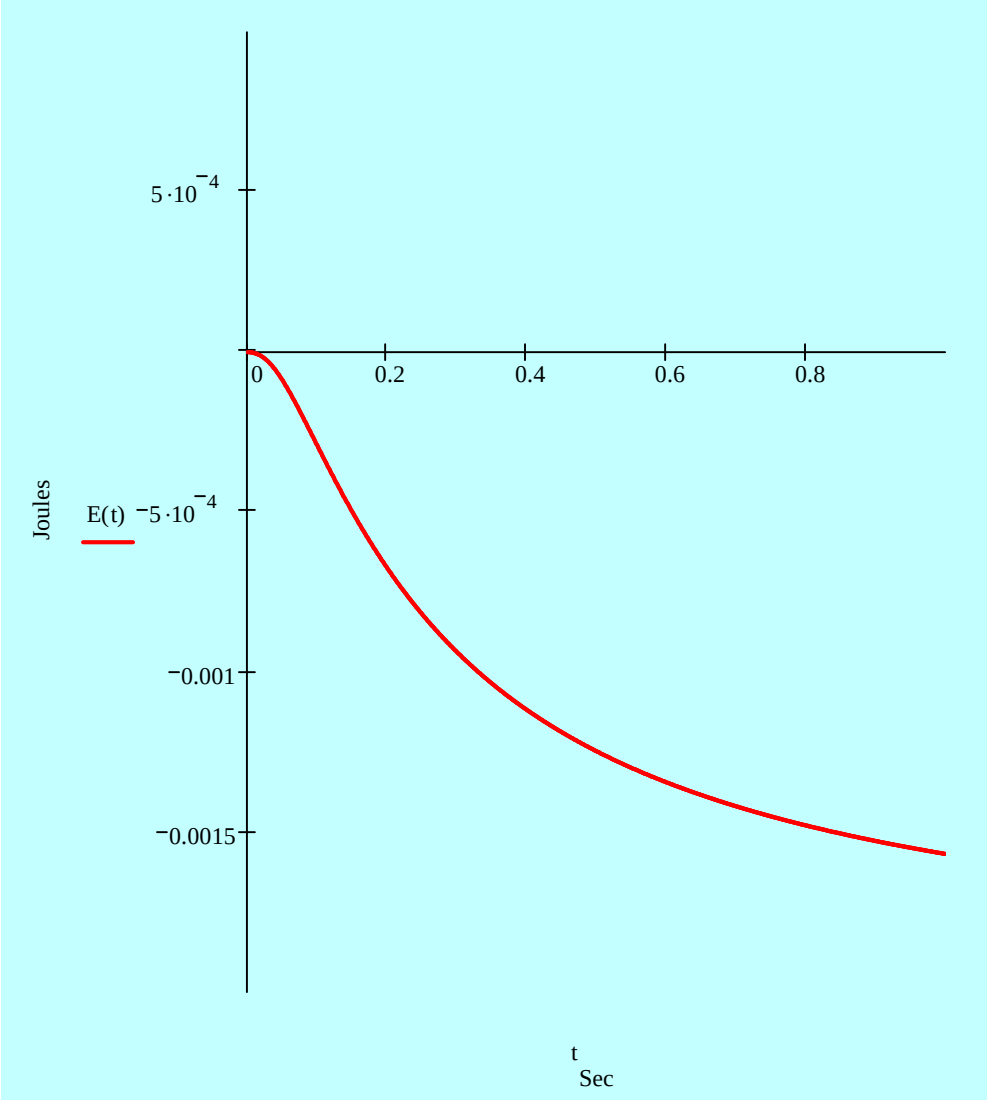

Figure 6. Ideal coil energy vs. time

Compute Ideal Mass Change of Coil:

$$M(t) := \frac{E(t)}{c^2}$$

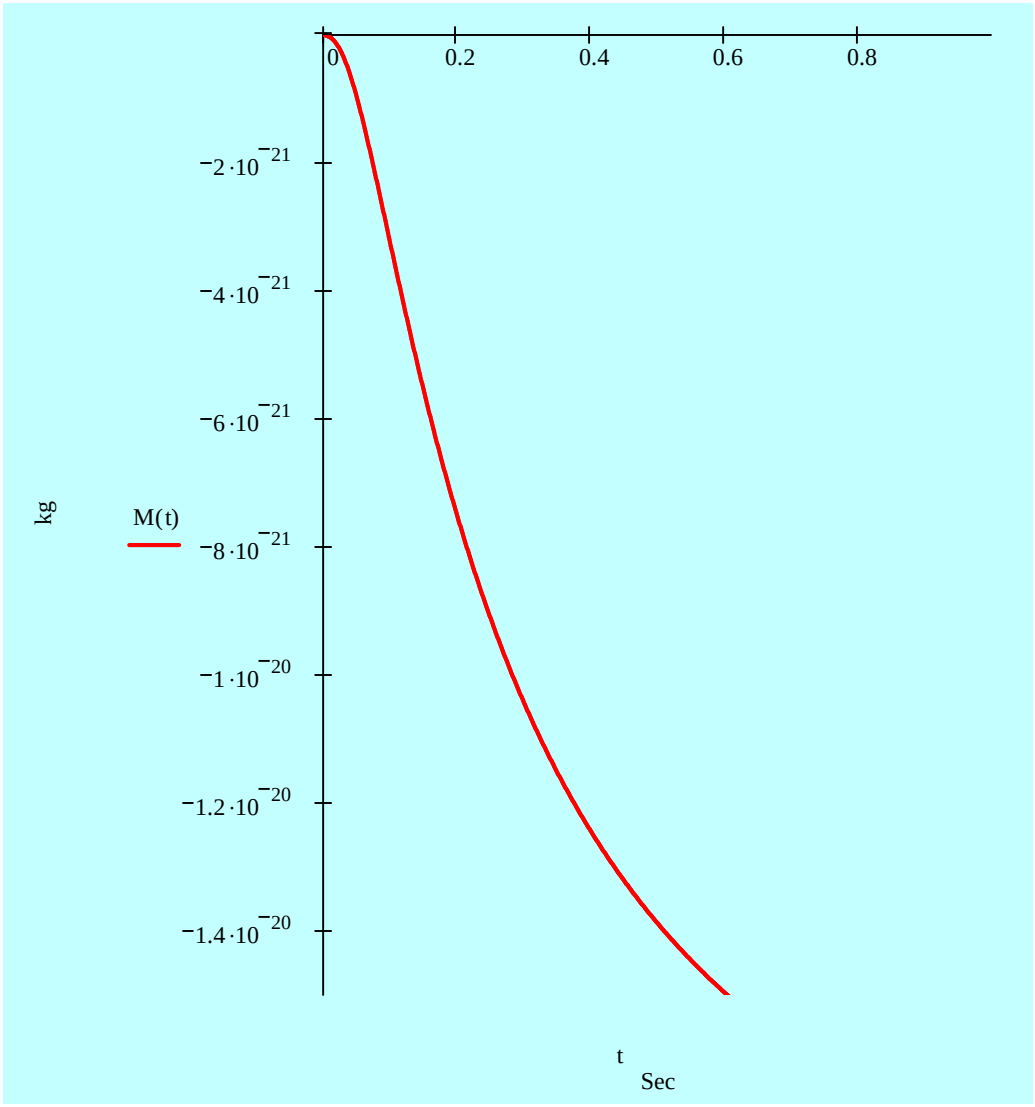

Figure 7. Mass vs. time

Compute Instantaneous Velocity of Inductor on the Earth:

$$\text{velocity}(t) := g \cdot \frac{L(t)}{LDOT(t)}$$

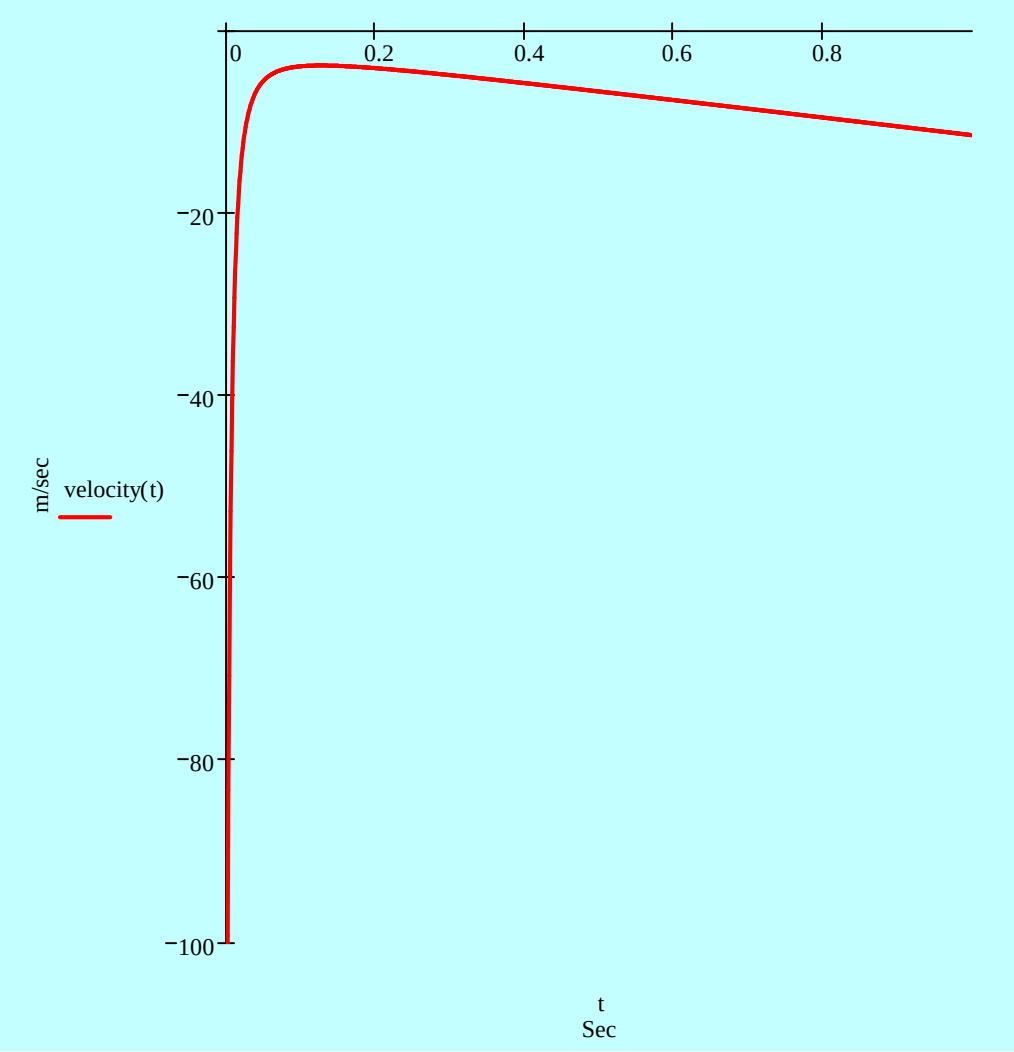

Figure 8. Inductor velocity vs. time

Compute non-Newtonian Force Produced By Coil:

$$F(t) := \text{velocity}(t) \cdot \frac{d}{dt} M(t)$$

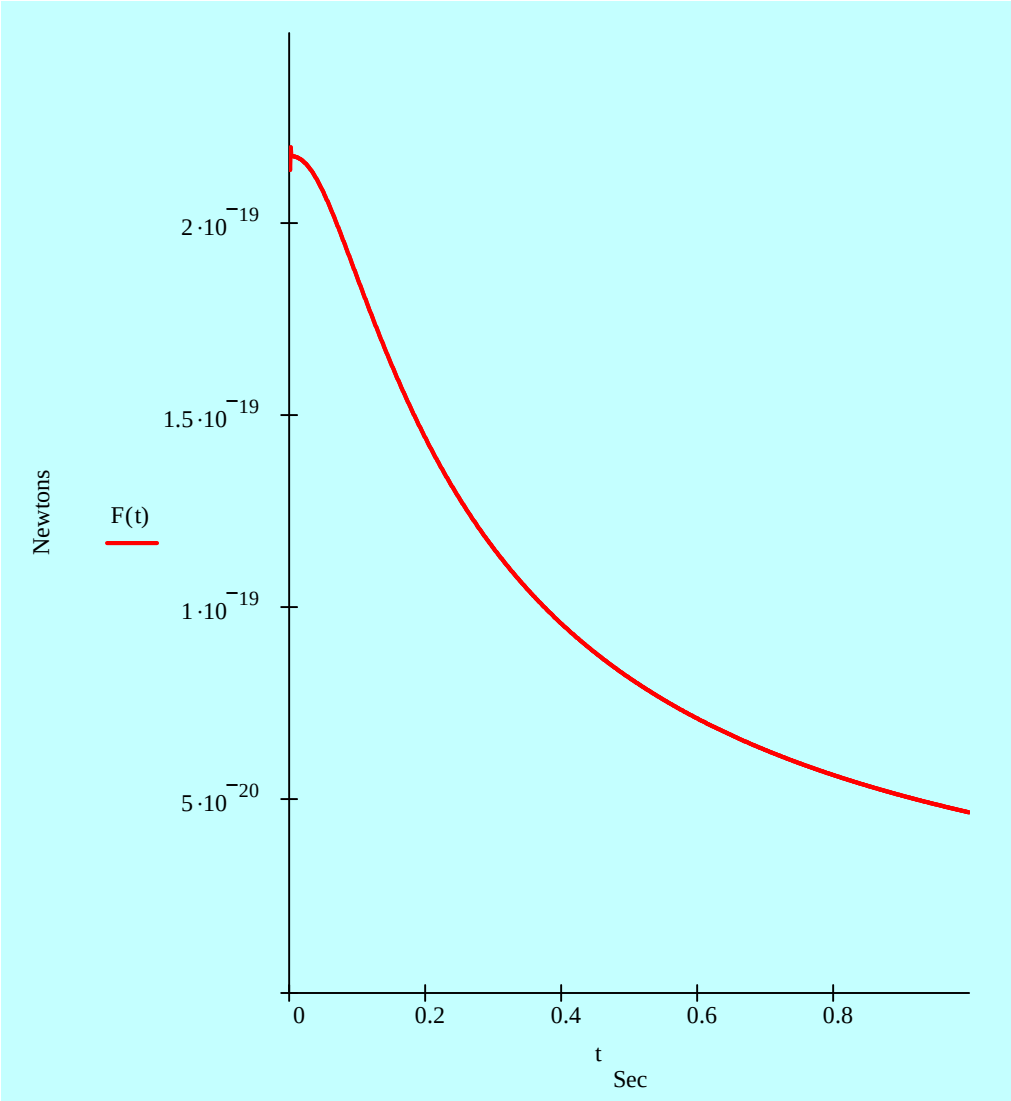

Figure 9. Force vs. time

The Inductive POSISTOR

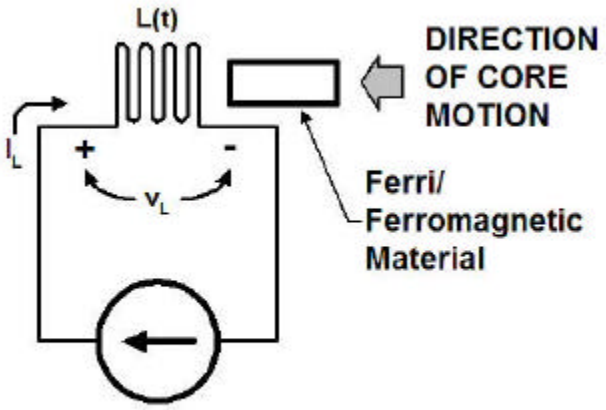

Figure 10. A fluctuating inductor L with Constant Current Source

Given:

$I := 0.5 \cdot amp$ $Lstart := 2.0 \cdot mH$

Motion Profile of Core Through Coil:

$$k(t) := 1 + \left(\frac{t^2 \cdot 6.5}{sec^2}\right) - \frac{t^3 \cdot 3.3}{sec^3} \qquad K := 1 + \left(\frac{Tend^2 \cdot 6.5}{sec^2}\right) - \frac{Tend^3 \cdot 3.3}{sec^3}$$

$$L(t) := Lstart \cdot k(t) \qquad Lend := Lstart \cdot K \qquad Lend = 0.0084\,H$$

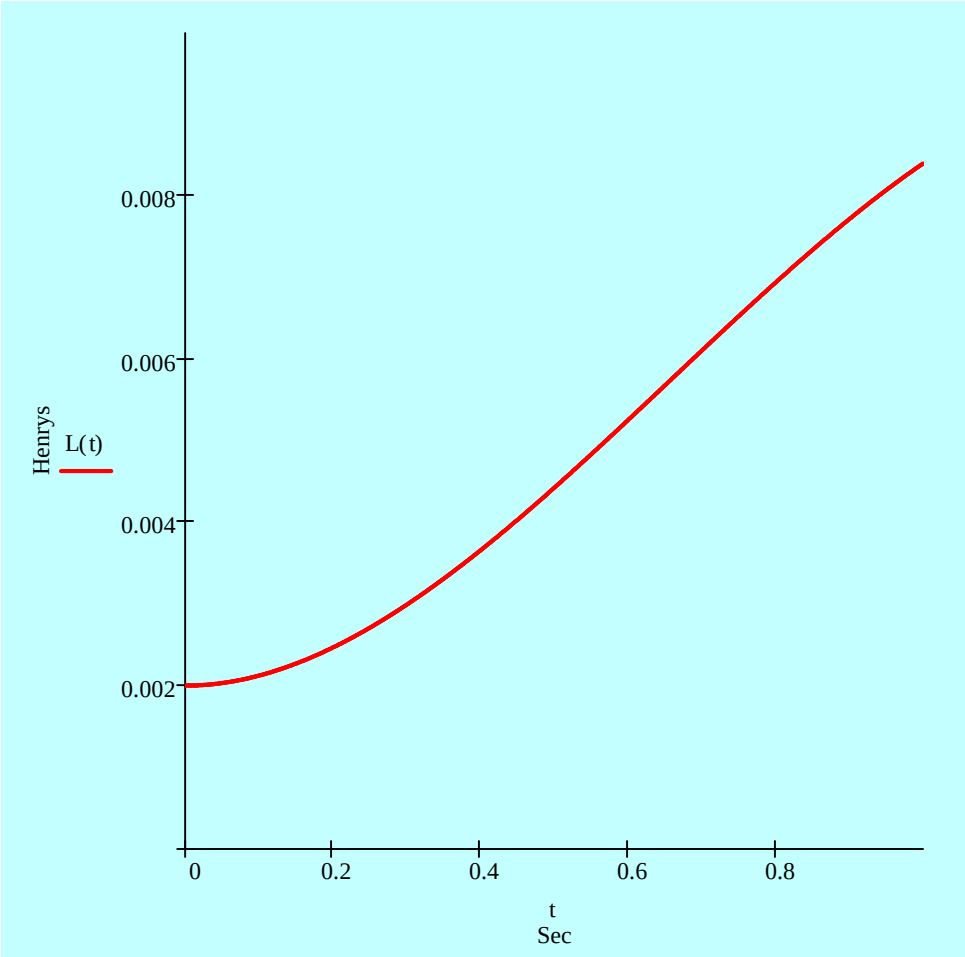

Figure 11. Ideal inductance vs. time

Compute Ideal Coil Gravimetric Resistance Term:

$$LDOT(t) := \frac{d}{dt} L(t)$$

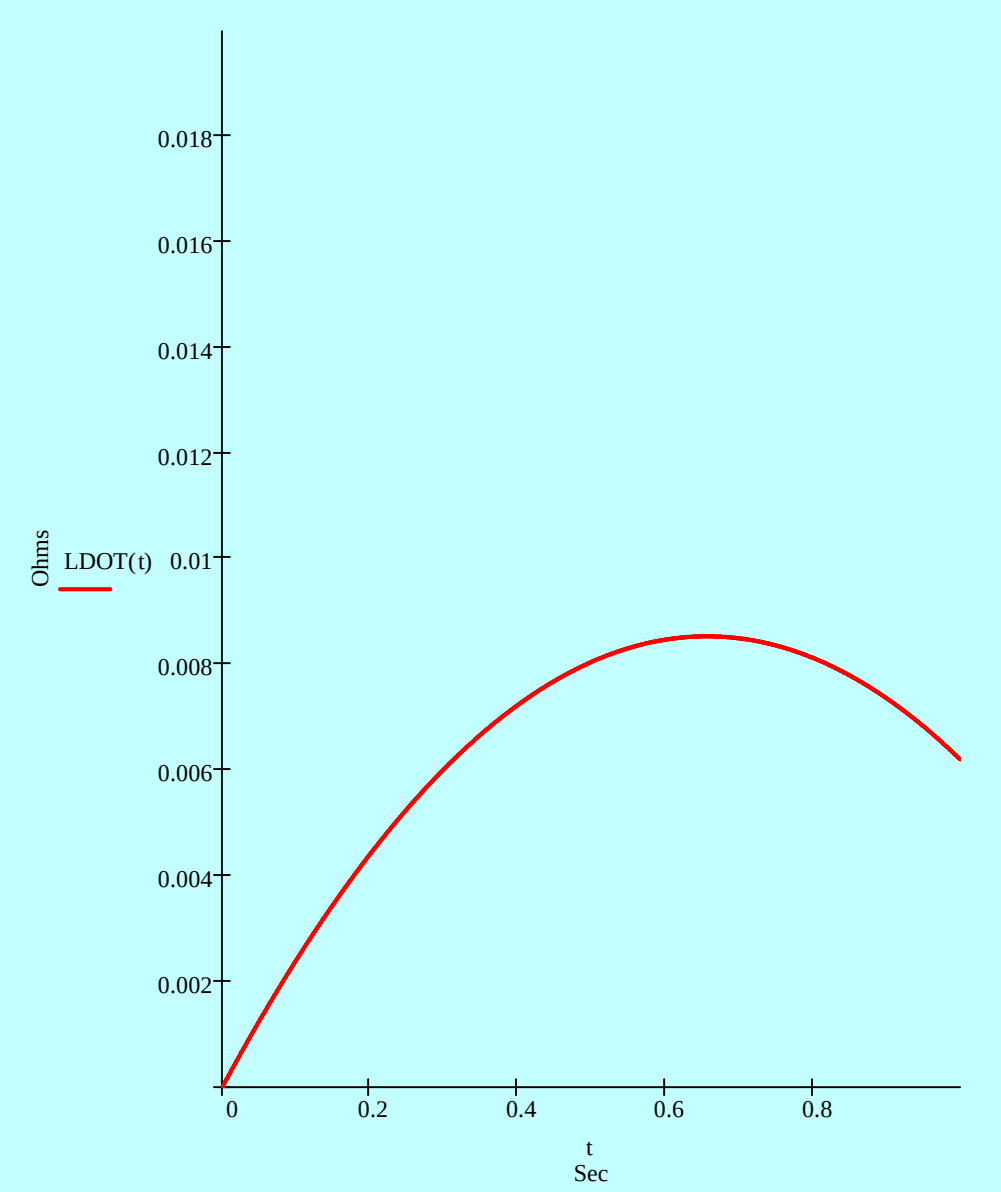

Figure 12. Ideal resistance vs. time

Compute Ideal Coil Gravimetric Voltage Term:

$v(t) := I \cdot LDOT(t)$

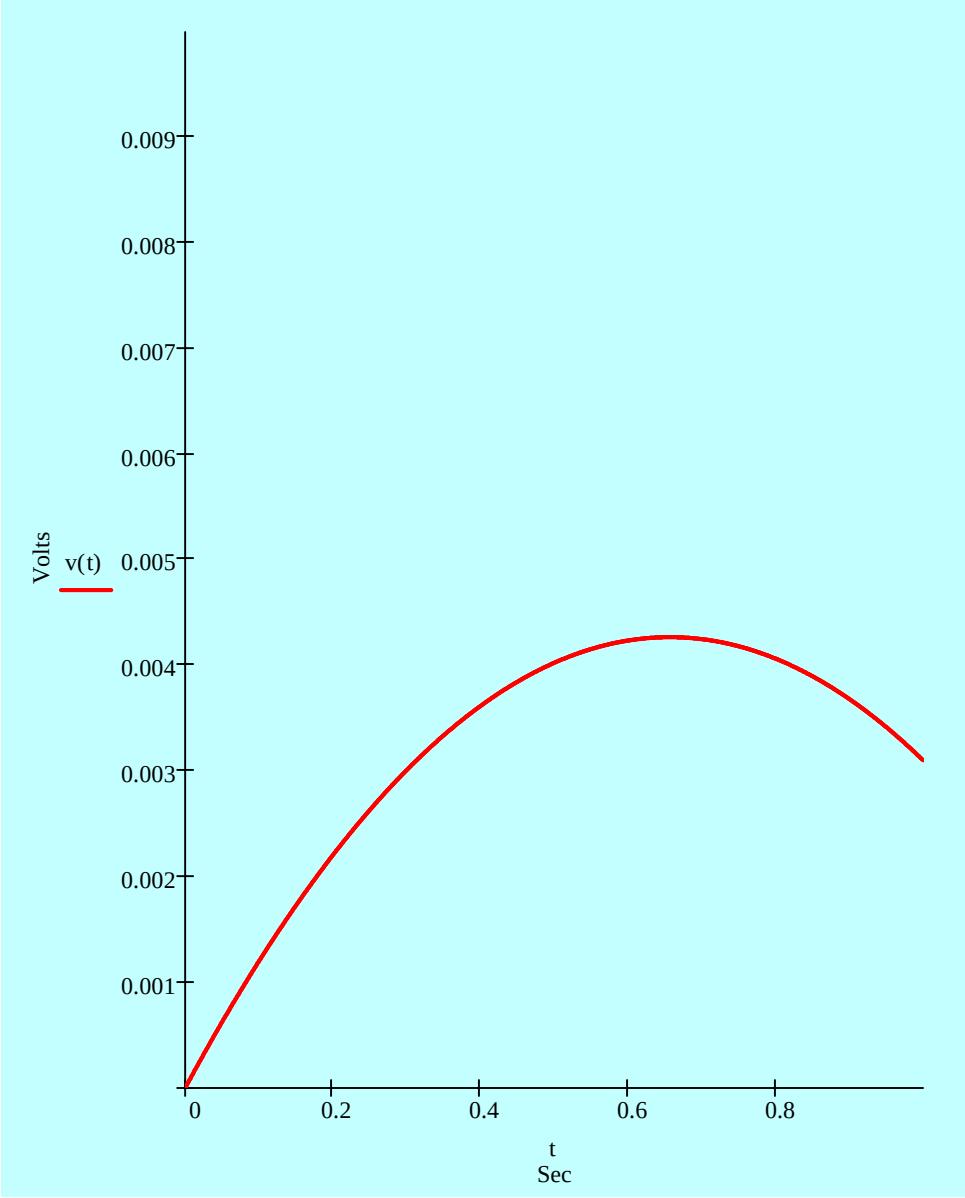

Figure 13. Ideal coil voltage vs. time

Compute Ideal Power Absorbed by Coil:

$P(t) := I \cdot v(t)$

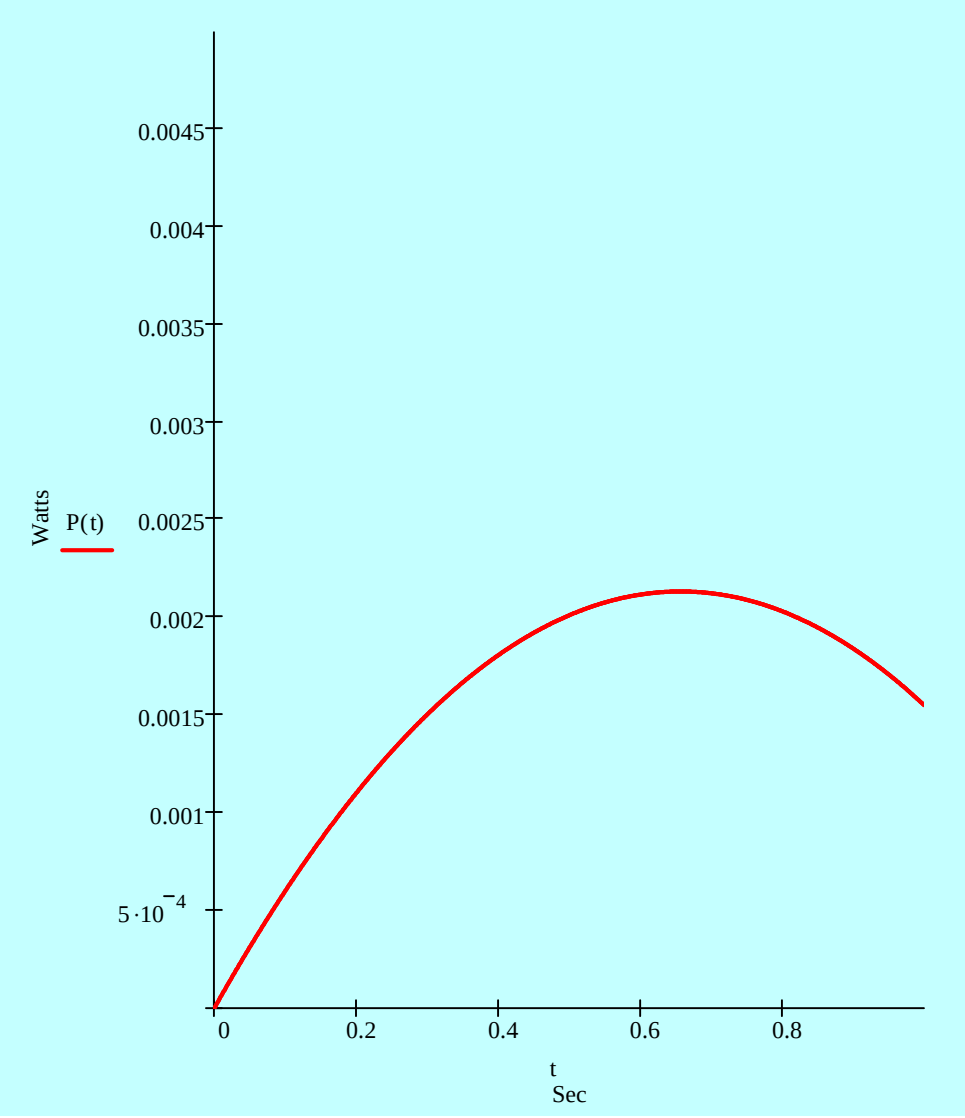

Figure 14. Ideal coil power vs. time

Compute Ideal Energy Stored in Coil:

$$E(t) := \int_{Tstart}^{t} P(t)\, dt$$

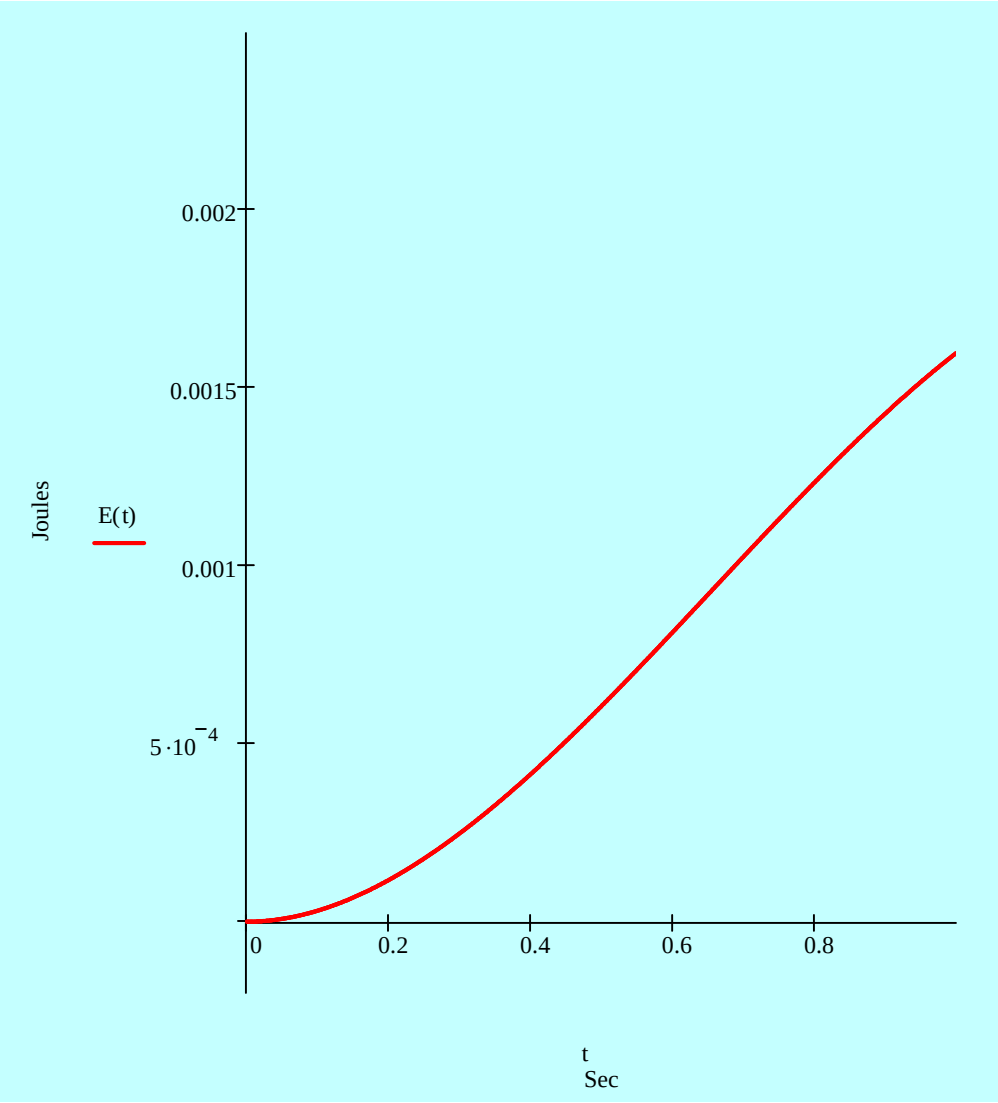

Figure 15. Ideal coil energy vs. time

Compute Ideal Mass Change of Inductor:

$$M(t) := \frac{E(t)}{c^2}$$

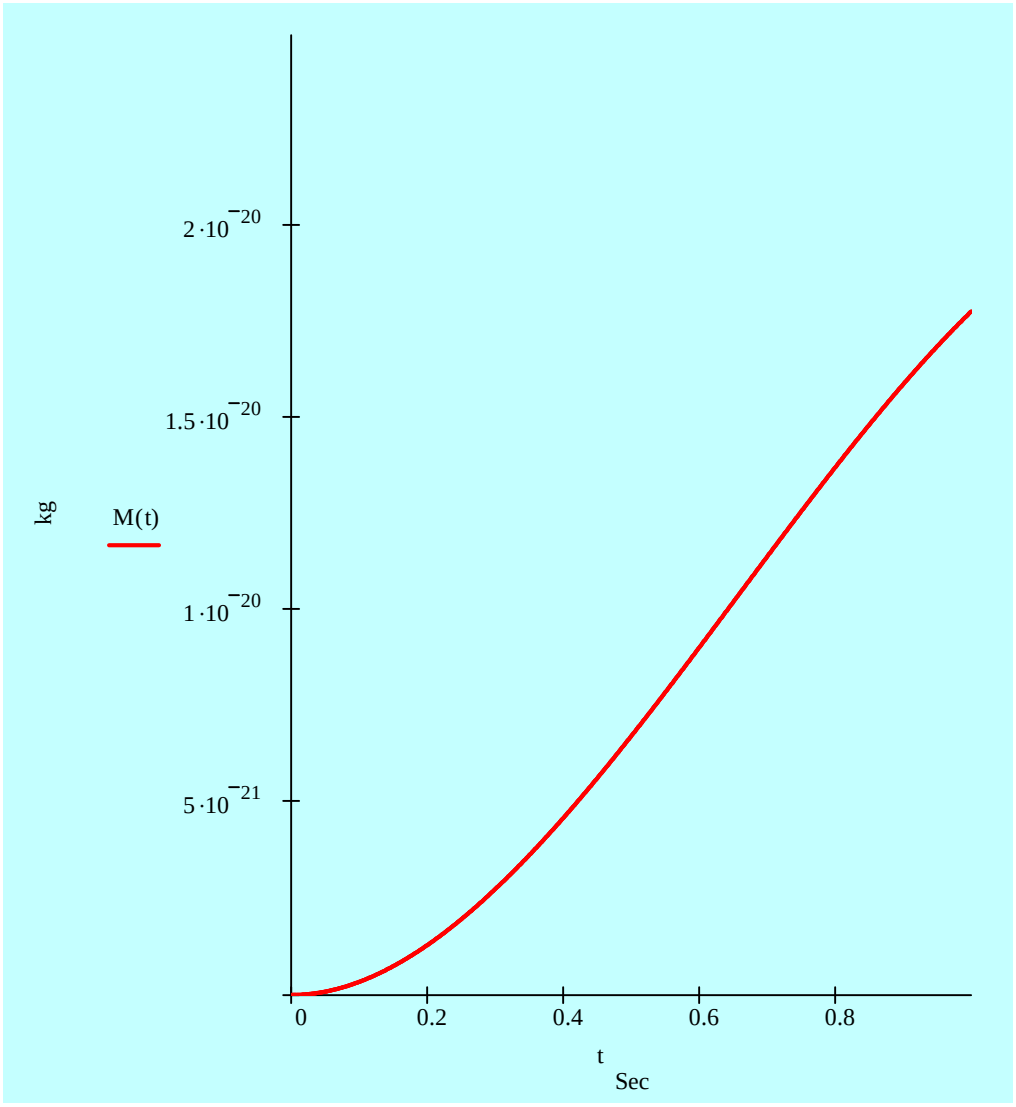

Figure 16. Mass vs. time

Compute Instantaneous Velocity of Inductor on the Earth:

$$\text{velocity}(t) := g \cdot \frac{L(t)}{LDOT(t)}$$

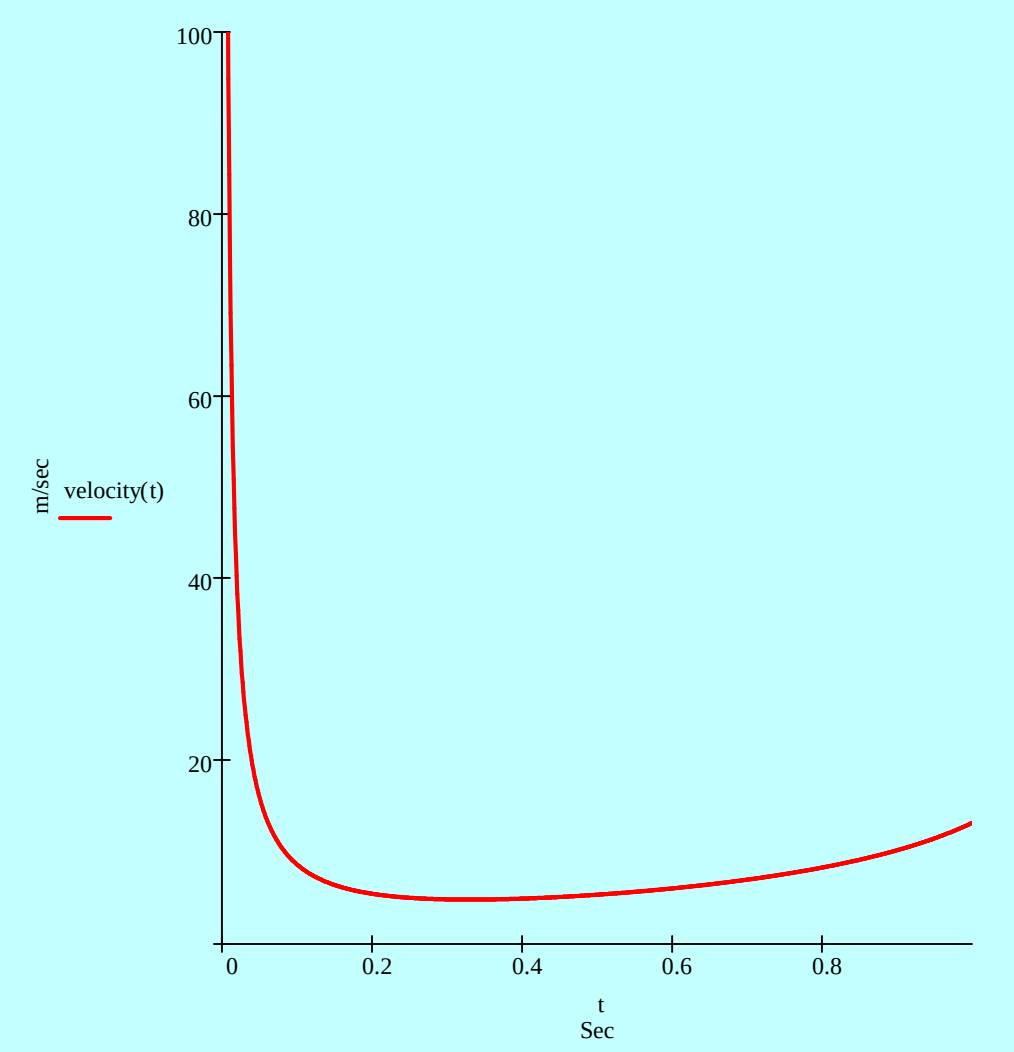

Figure 17. Inductor velocity vs. time

Compute non-Newtonian Force Produced By Coil:

$$F(t) := \text{velocity}(t) \cdot \frac{d}{dt} M(t)$$

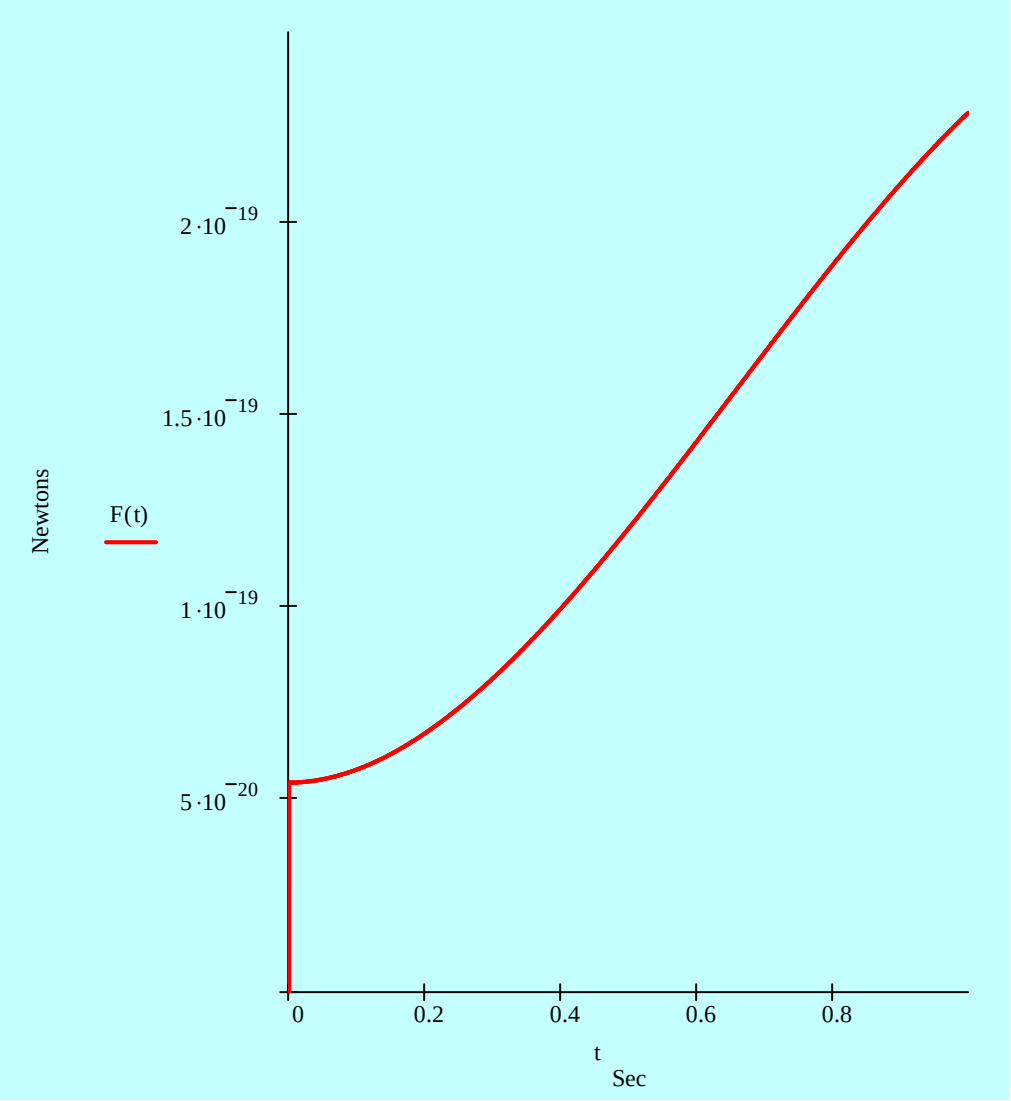

Figure 18. Force vs. time