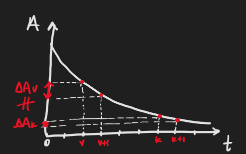
Δε 11-1-2021



$$A_\nu = A_0 \cdot e^{-\Lambda t_\nu} = A_0 e^{-\Lambda \cdot \nu \cdot T}$$

$$A_{\nu+1} = A_0 \cdot e^{-\Lambda t_{\nu+1}} = A_0 e^{-\Lambda(\nu+1)T}$$

$$\Delta A = A_{\nu+1} - A_\nu = A_0 e^{-\Lambda(\nu+1)T} - A_0 e^{-\Lambda T} =$$

$$= A_0 \cdot \underbrace{e^{-\Lambda\nu T - \Lambda T}}_{*} - A_0 e^{-\Lambda T} =$$

$$= A_0 \cdot e^{-\Lambda\nu T} \cdot e^{-\Lambda T} - A_0 e^{-\Lambda t}$$

$$\boxed{\Delta A = A_0 e^{-\Lambda\nu T}(e^{-\Lambda T} - 1)} \quad (<0)$$

(*) $\alpha^{x+y} = \alpha^x \cdot \alpha^y$

η μεταβολή εξαρτάται από τον αριθμό ν της περιόδου

Σε αρχικά A_ν έχω μεταβολή ΔA
Στα 100 x;

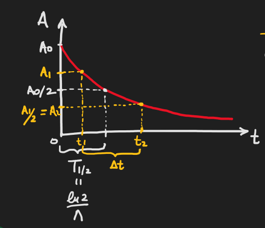
$$A_\nu \cdot x = \Delta A \cdot 100\% \Rightarrow$$

$$\Rightarrow \cancel{A_0 e^{-\Lambda\nu T}} \cdot x = \cancel{A_0 e^{-\Lambda\nu T}}(e^{-\Lambda T} - 1) \cdot 100\% \Rightarrow$$

$$\Rightarrow \boxed{x = (e^{-\Lambda T} - 1) 100\%} \quad (<0)$$

το ποσοστό μεταβολής είναι πάλι σταθερό (ανεξάρτητο του ν)

ΦΑΤ: $\left.\begin{array}{l} t_1 \rightarrow A_1 \\ t_2 \rightarrow A_2 = A_1/2 \end{array}\right\}$ $\Delta t = t_2 - t_1 = ?$



- $A_1 = A_0 \cdot e^{-\Lambda t_1}$
- $A_2 = A_0 \cdot e^{-\Lambda t_2} \Rightarrow \frac{A_1}{2} = A_0 \cdot e^{-\Lambda t_2} \Rightarrow$

$$\Rightarrow \frac{\cancel{A_0} \cdot e^{-\Lambda t_1}}{2} = \cancel{A_0} \cdot e^{-\Lambda t_2} \Rightarrow$$

$$\Rightarrow e^{-\Lambda t_1} = 2 e^{-\Lambda t_2} \Rightarrow$$

$$\Rightarrow \frac{e^{-\Lambda t_1}}{e^{-\Lambda t_2}} = 2 \Rightarrow e^{-\Lambda t_1 + \Lambda t_2} = 2 \Rightarrow$$

$$\Rightarrow e^{\Lambda(t_2 - t_1)} = 2 \Rightarrow e^{\Lambda \cdot \Delta t} = 2 \Rightarrow$$

$$\Rightarrow \cancel{\ln} \cancel{e}^{\Lambda \Delta t} = \ln 2 \Rightarrow \Lambda \cdot \Delta t = \ln 2 \Rightarrow \boxed{\Delta t = \frac{\ln 2}{\Lambda}}$$

Ρυθμός Απώλειας Ενέργειας
στην ΦΑΤ ($F' = -b\upsilon$)

$$\frac{dE_{\tau\alpha\lambda}}{dt} = \frac{dW_{F'}}{dt} = \frac{F' \cdot dx}{dt} = F' \cdot \upsilon = -b \cdot \upsilon \cdot \upsilon = -b\upsilon^2$$

(Joule/sec)

π.χ. Έστω ότι σε κάθε T
το πλάτος υποδιπλασιάζεται (−50%)

$t_0 = 0 \longrightarrow A_0$
$\quad$ −50%, $\Delta A^* = -A_0/2$
$t_1 = T \longrightarrow A_0/2$
$\quad$ −50%, $\Delta A^* = -A_0/4$
$t_2 = 2T \longrightarrow \left(\frac{A_0}{2}\right)/2 = \frac{A_0}{4}$
$\quad$ −50%, $\Delta A^* = -A_0/8$
$t_3 = 3T \longrightarrow \left(\frac{A_0}{4}\right)/2 = \frac{A_0}{8}$
$\quad$ −50%, $\Delta A^* = -A_0/16$
$t_4 = 4T \longrightarrow \left(\frac{A_0}{8}\right)/2 = \frac{A_0}{16}$
⋮
$t_\nu = \nu \cdot T \longrightarrow ?$

$t_0 = 0 \longrightarrow A_0 \longrightarrow \frac{A_0}{2^0}$
$t_1 = T \longrightarrow \frac{A_0}{2} \longrightarrow \frac{A_0}{2^1}$
$t_2 = 2T \longrightarrow \left(\frac{A_0}{2}\right)/2 = \frac{A_0}{4} \longrightarrow \frac{A_0}{2^2}$
$t_3 = 3T \longrightarrow \left(\frac{A_0}{4}\right)/2 = \frac{A_0}{8} \longrightarrow \frac{A_0}{2^3}$
$t_4 = 4T \longrightarrow \left(\frac{A_0}{8}\right)/2 = \frac{A_0}{16} \longrightarrow \frac{A_0}{2^4}$
⋮
$\boxed{t_\nu = \nu \cdot T \longrightarrow \frac{A_0}{2^\nu}}$

Υπο-x-πλασιασμός του πλάτους:

$t_0 = 0 \longrightarrow A_0$
$t_1 = T \longrightarrow A_0/x$
$t_2 = 2T \longrightarrow \left(\frac{A_0}{x}\right)/x = \frac{A_0}{x^2}$
$t_3 = 3T \longrightarrow \left(\frac{A_0}{x^2}\right)/x = \frac{A_0}{x^3}$
$t_4 = 4T \longrightarrow \left(\frac{A_0}{x^3}\right)/x = \frac{A_0}{x^4}$
⋮
$\boxed{t_\nu = \nu \cdot T \longrightarrow \frac{A_0}{x^\nu}}$