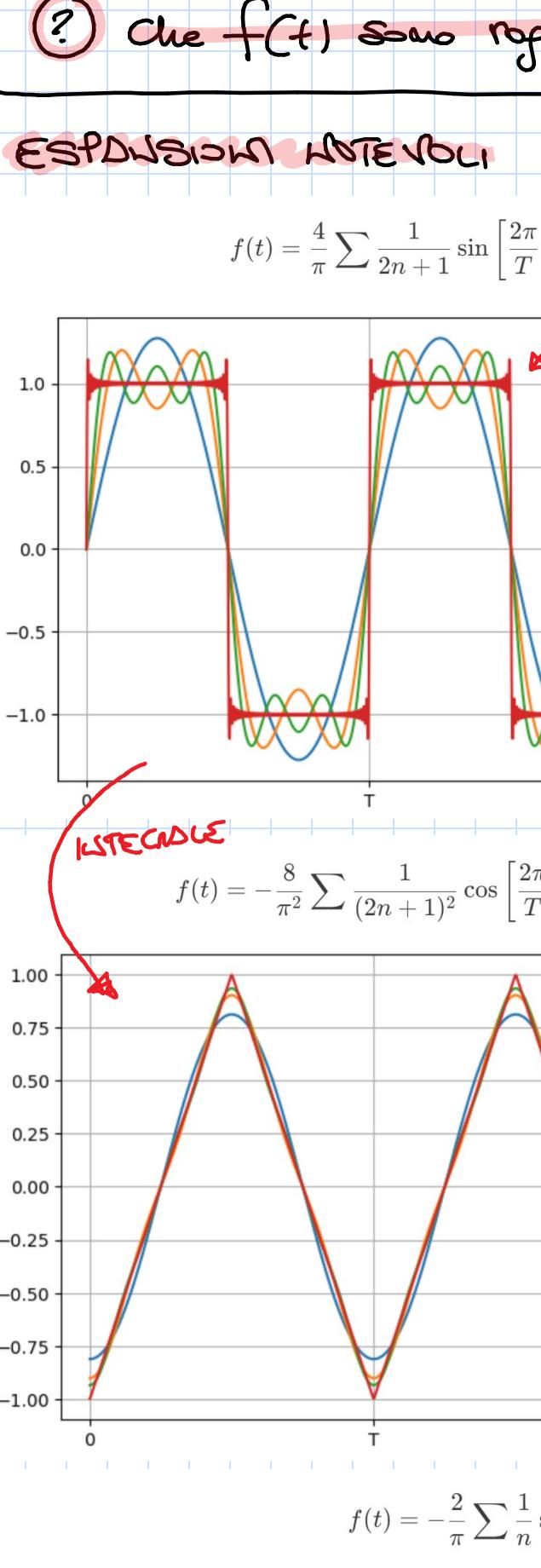


CE2001E 250929 INTRO TO THE DISCRETE FOURIER TRANSFORM



Coefficiente di Fourier

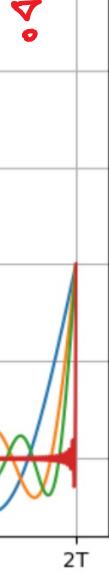
ogni? G.R. UNIFORME, PONTEALE,
IN NORMA...
⇒ CORSO METODI

disponi
+ 1) · t]

$e^{i\theta} = \cos\theta + i\sin\theta\dots$

! Onda Quadrata

Le componenti delle discontinuità...



disponi ...
+ 1) · t]

Onda Tridimensionale

Continua e Cintata
⇒ CONVERGE "BENE"
(conv. uniforme garantita da teorema Dirichlet)



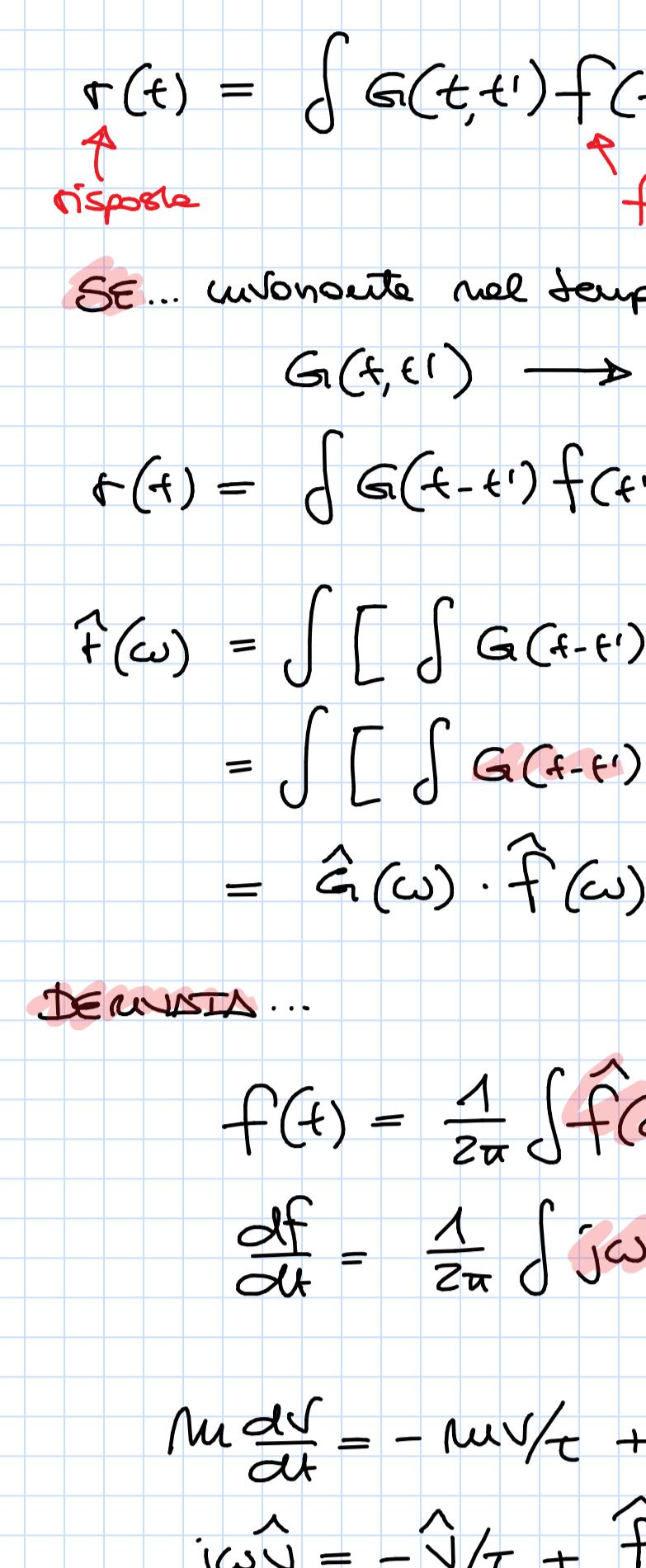
$\frac{2\pi}{T} n \cdot t$

TRANSFORMATO ... CONOWT
~~+ T/z~~

$\hat{f} \hat{f}(z)$ $\int f(z)$

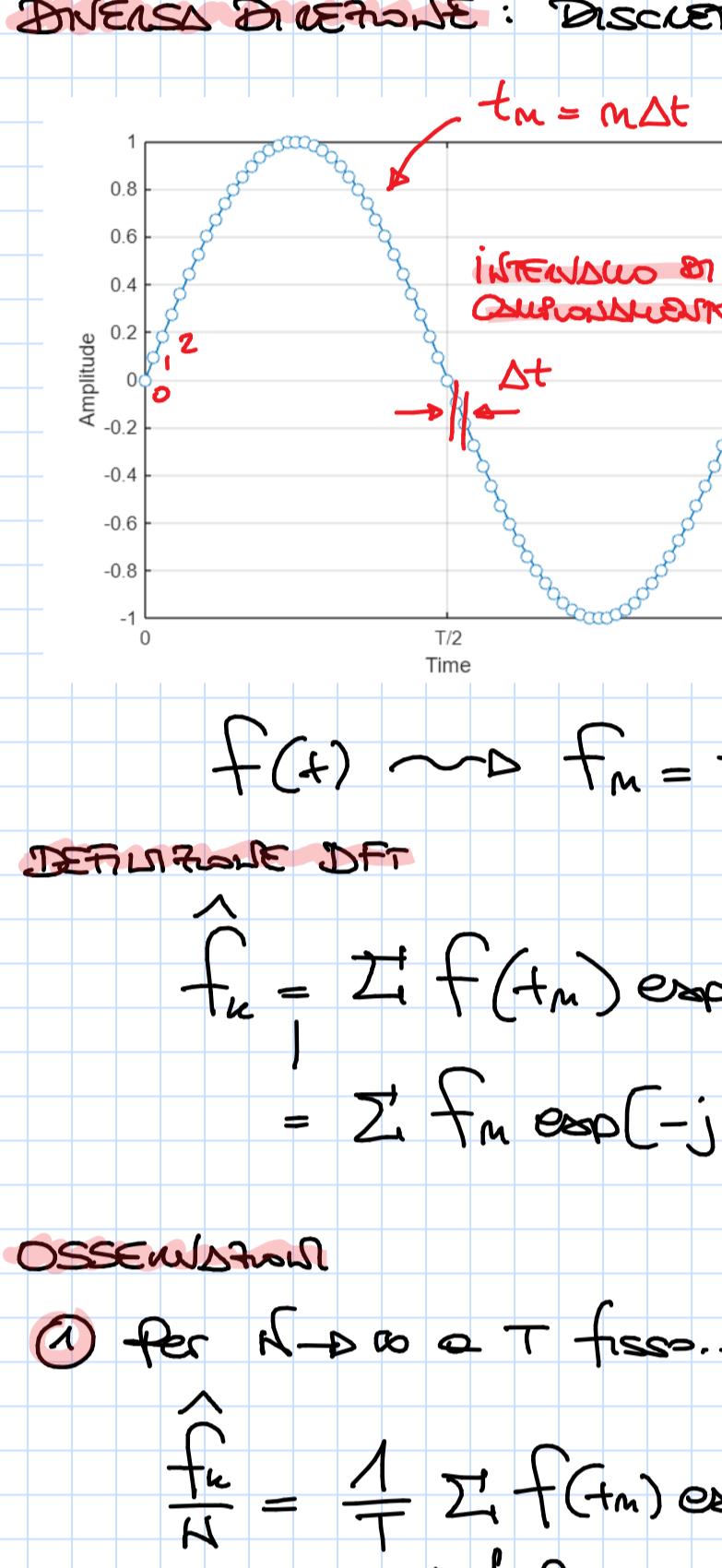
$$\hat{f}(\omega) = \int f(t) e^{-j\omega t} dt$$

TRUST.



dipende
de dif

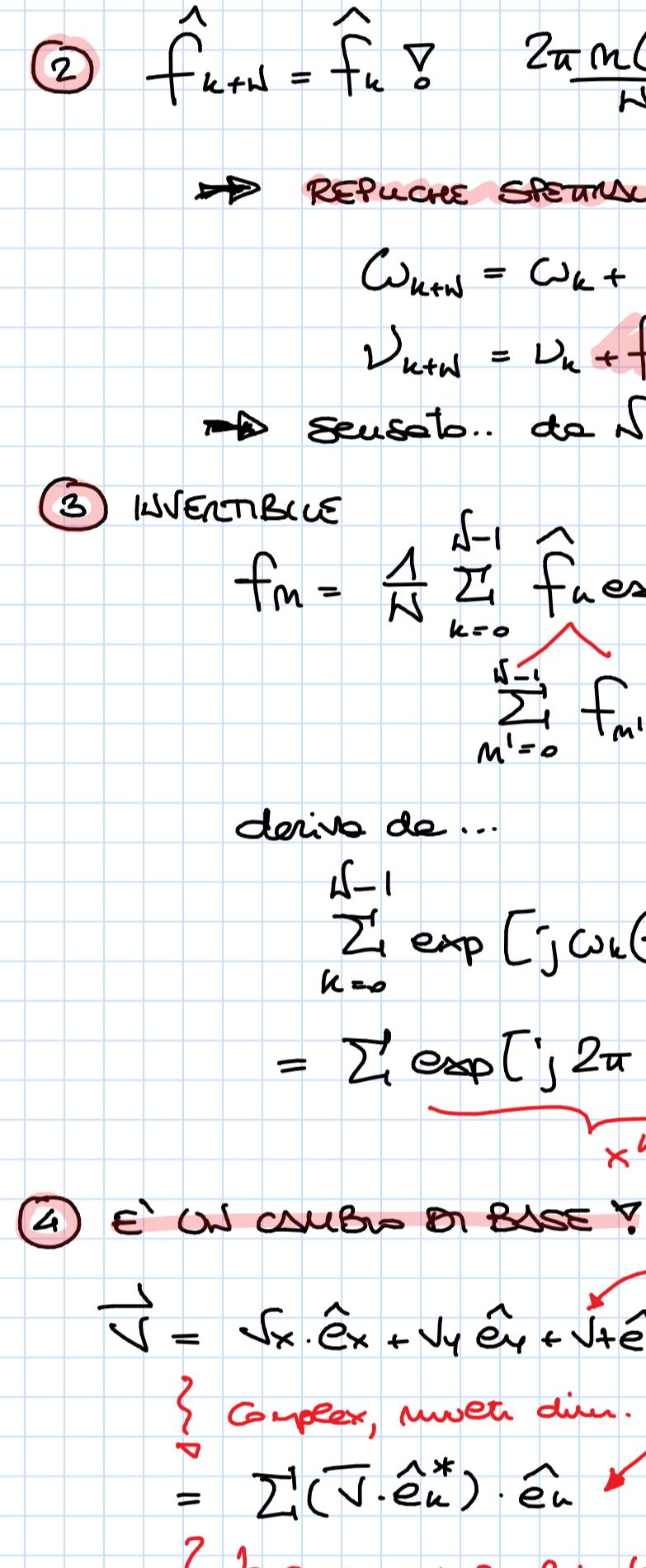
$$= (G \star f)(t)$$



~~TRIANGLE TÉTRI~~

$$T = W \Delta t$$

$$x_m) = f(m\Delta t)$$



- rechteckig

$$\gamma = \sum \frac{\vec{r} \cdot \vec{e}_u^*}{\vec{e}_u \cdot \vec{e}_u^*} \cdot \vec{e}_u$$

$$\begin{aligned}\vec{t} &= (t_0, t_1, \dots, t_{N-1}) \\ \vec{e}_n &= (\exp(j\omega_k t_0), \exp(j\omega_k t_1), \dots, \exp(j\omega_k t_{N-1})) \\ \vec{e}_k \cdot \vec{e}_n^* &= \sum S_{k,n}\end{aligned}$$

$f_u = f \cdot e_u = \sum f_m \exp(-j\omega_k t_m)$

PLACE SETTANCE : esempio segnale $f_{sig} = 1 \text{ kHz}$

Plot	Sampling Frequency (f_s)	Number of Samples (N)
A	10000 Sa/s	1000
B	10000 Sa/s	1025

$f_{\text{sig}} = \frac{1}{T_{\text{sig}}} \in \left\{ \frac{\omega_k}{2\pi} \right\}$? Si se $T = k T_{\text{sig}}$ intero.

$\frac{\omega_k}{2\pi} = \frac{1}{T} \quad k$

A $f_s = 10^4 \quad N = 10^3 \quad T = \frac{N}{f_s} = 100 \mu\text{sec}$
 $T_{\text{sig}} = 1 \mu\text{sec} \Rightarrow 100 \text{ periodi}$

B $N = 102.5 \quad T = \frac{N}{f_s} = 102.5 \mu\text{sec}$
 $\Rightarrow 102.5 \text{ periodi?}$

$$\hat{f}_k = \sum_{m=0}^{N-1} e^{j\omega_{\text{sig}} t_m} \cdot e^{-j\omega_k t_m}$$
 $= \sum \left\{ \exp \left[j (\omega_{\text{sig}} - \omega_k) \Delta t \right] \right\}^m$

\hat{F}_k ω_k ω_{sig} ω_k ω_{sig} ω_k

Compimento DFT
 dipende da dove
 cosiamo ω_k discreti...

ROTAZIONE ANCHE: LA DFT, PER DEFINIZIONE, DESCRIVE UN SEGNALE CON PERIODICITÀ T .. MA NON È DETTO CHE IL SEGNALE VERO...

CAMBIAMENTO T SEGUENTE VERO COSÌ DESCRIVE DFT..

f(t) $\in \mathbb{R} \Rightarrow f^*(f) = f(f) \Rightarrow \hat{f}_{-k} = \hat{f}_k^*$

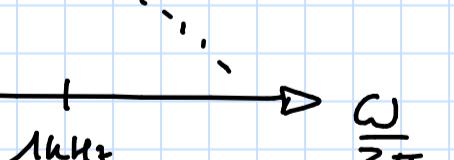
Sketcho
BLOQUE

Successivo usare SPECTRO UNIFORME

$$f_k = 2 \lceil \hat{f}_u \rceil / N$$

ampiezza d'onda ...

AVETE CONSIDERATO SBAGLIATO QUALcosa


$$\frac{\omega}{2\pi}$$

$$\hat{f}_n = \sum f_m e^{-j\omega n t}$$

↑ noise $\alpha \neq t$
è scorreto?

OSSIA..

$$E[(f_{m_1} - \mu_1)(f_{m_2} - \mu_2)] = \sigma^2 \delta_{m_1, m_2}$$

AICORS... $\hat{\sigma}_{f_n}^2 = N \sigma^2$ COSTANTE. "Noise bianco"

The figure consists of two separate plots on grid paper.

Left Plot: A red shaded elliptical region centered at \bar{P} (indicated by a red dot). A green line passes through the center of the ellipse. The angle between the horizontal axis and the green line is labeled $\theta/\sqrt{2} \dots$. The vertical distance from the center to the green line is labeled σ_{modos} . The horizontal distance from the center to the green line is labeled σ_{fase} .

Right Plot: A red shaded elliptical region centered at \bar{P} . A green line passes through the center of the ellipse. The vertical axis is labeled I_{in} . The horizontal axis is labeled P_x . A green line is drawn tangent to the ellipse at its center. A blue circle is drawn around the center of the ellipse. A green arrow points from the text "error fijo depende del modo??" towards the ellipse.

what is BT FIT...
guess?
Weights = vector $1/\sigma^2$

```
beta = nlinfit(X,Y,modelfun,beta0)
beta = nlinfit(X,Y,modelfun,beta0,options)
beta = nlinfit(___,Name,Value)
[beta,R,J,CovB,MSE>ErrorModelInfo] = nlinfit(___)
```

$$\chi^2 = \sum_i \frac{[y_i - f(x_i)]^2}{\sigma_i^2}$$
$$= \sum_i w_i [y_i - f(x_i)]^2$$

Notice Correlation

$$(R' * R) / (\lambda - p) = \dots$$

per

χ^2_m !

Sample!

$[y_k - f(\cdot)]$

$\frac{y_k - f(\cdot)}{\sigma_k}$

Absolute Standard FALSE

use $\sigma_p^2 = \text{Cov}B$

Reciprocal Correlation Non Isolated

