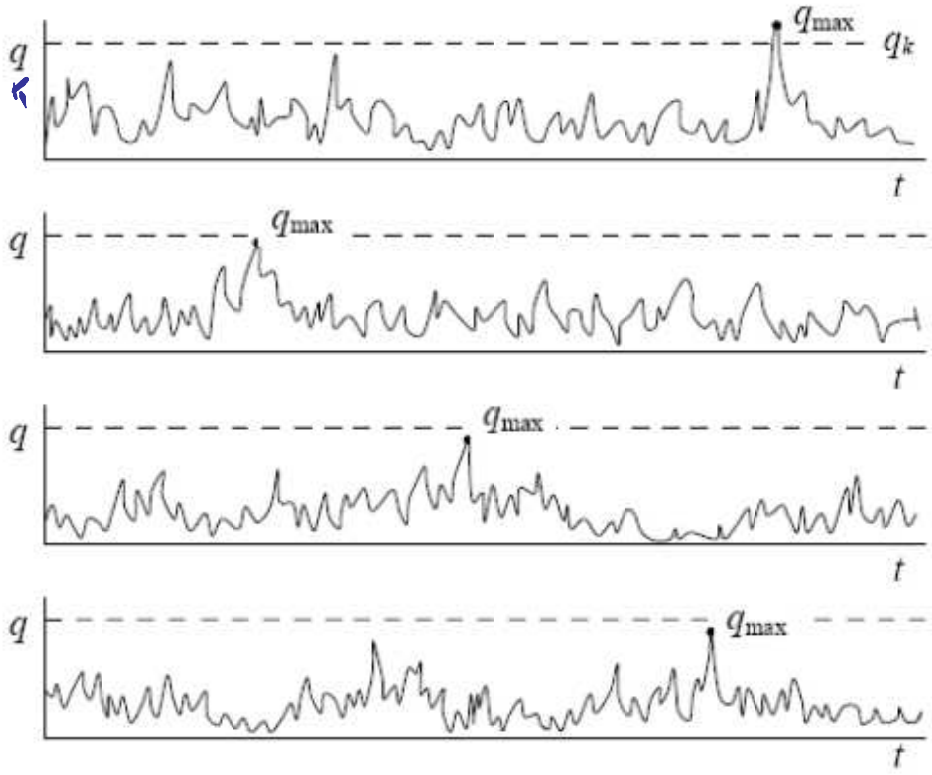
q_k

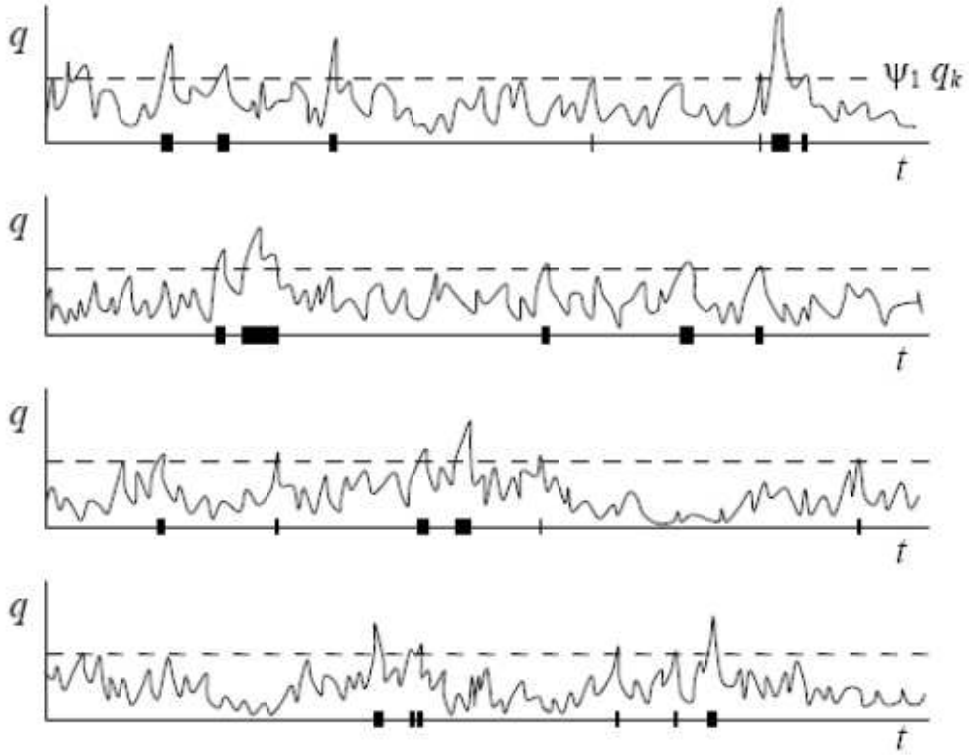


5%

95%

valore caratteristico frattile 95% dei massimi

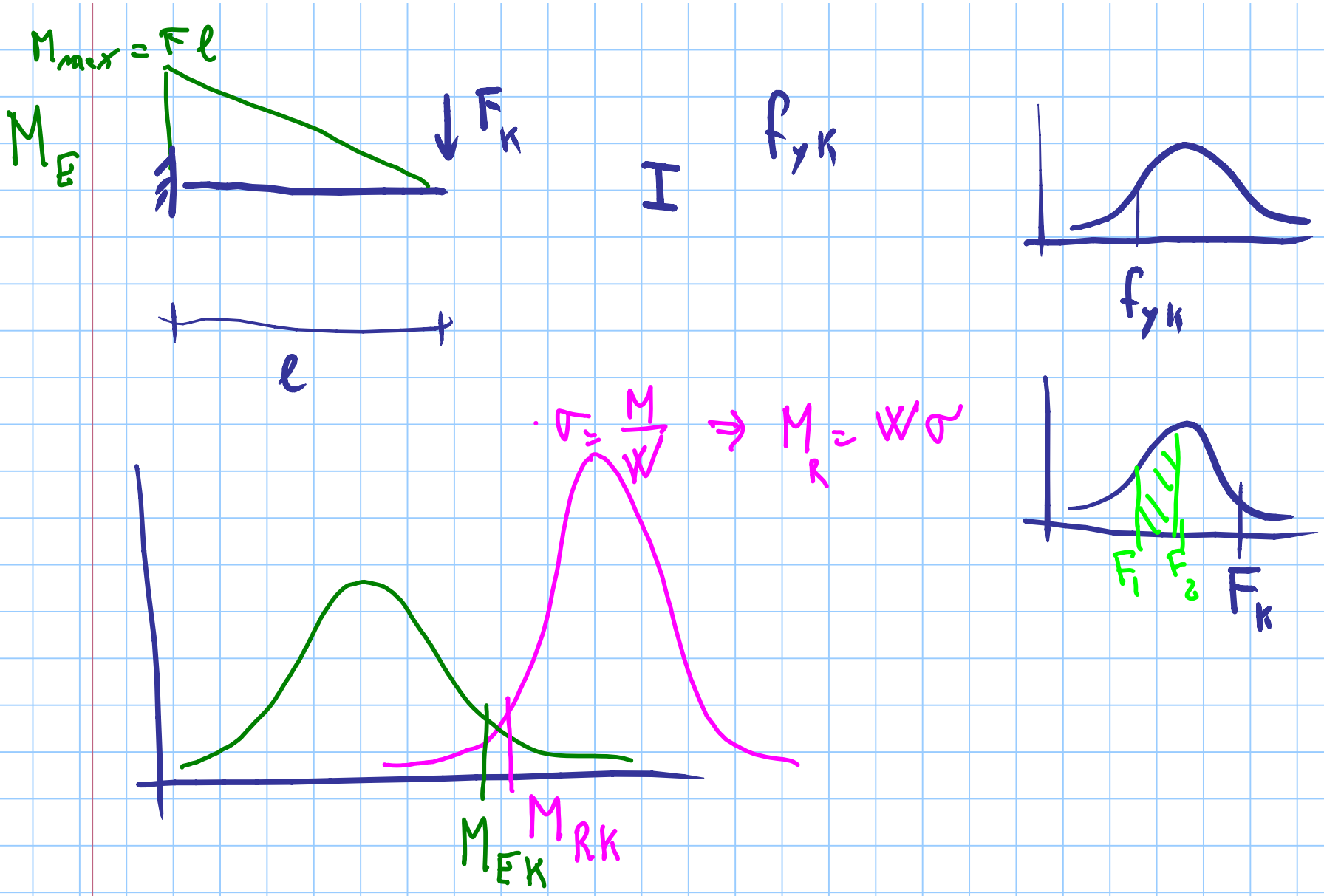
carichi variabili nel tempo



valore frequente $\psi_1 q_k$

nel 95% del tempo il carico è minore

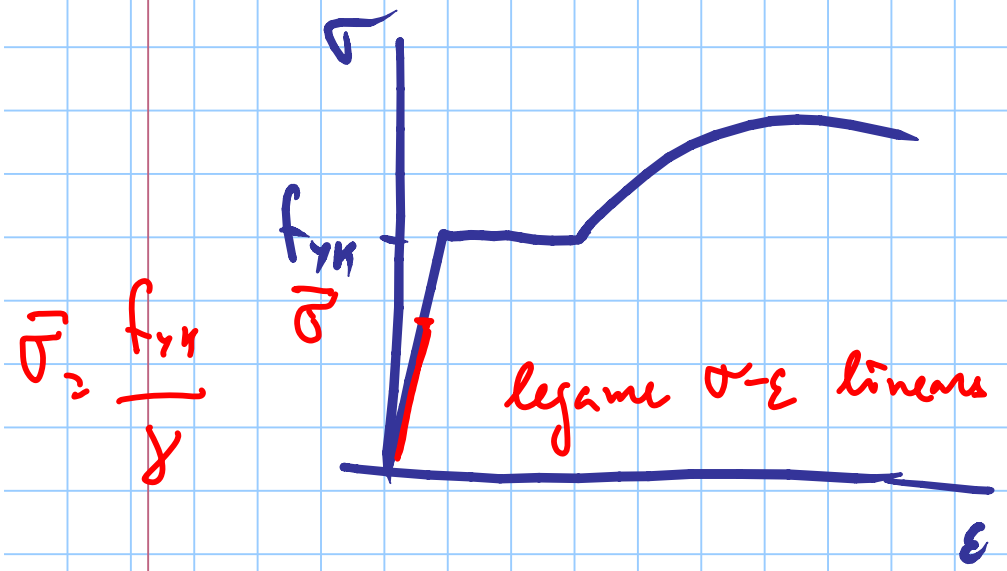
valore quasi permanente → media nel tempo $\psi_2 q_k$


$M_{max} = F\ell$
M_E
F_K
ℓ
I
f_{yK}
f_{yK}
$\sigma = \frac{M}{W} \Rightarrow M_K = W\sigma$
F_1
F_2
F_K
M_{EK}
M_{RK}

FARE RIFERIMENTO A q_k f_{yk}

non da sufficiente sicurezza

1) USARE UN FATTORE DI SICUREZZA PER σ

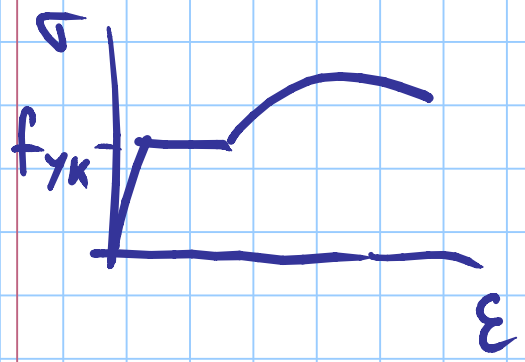


$\bar{\sigma}$ Tensione ammissibile

VERIFICA: $\sigma \leq \bar{\sigma}$

METODO DELLE TENSIONI AMMISSIBILI

2) CALCOLO A ROTTURA

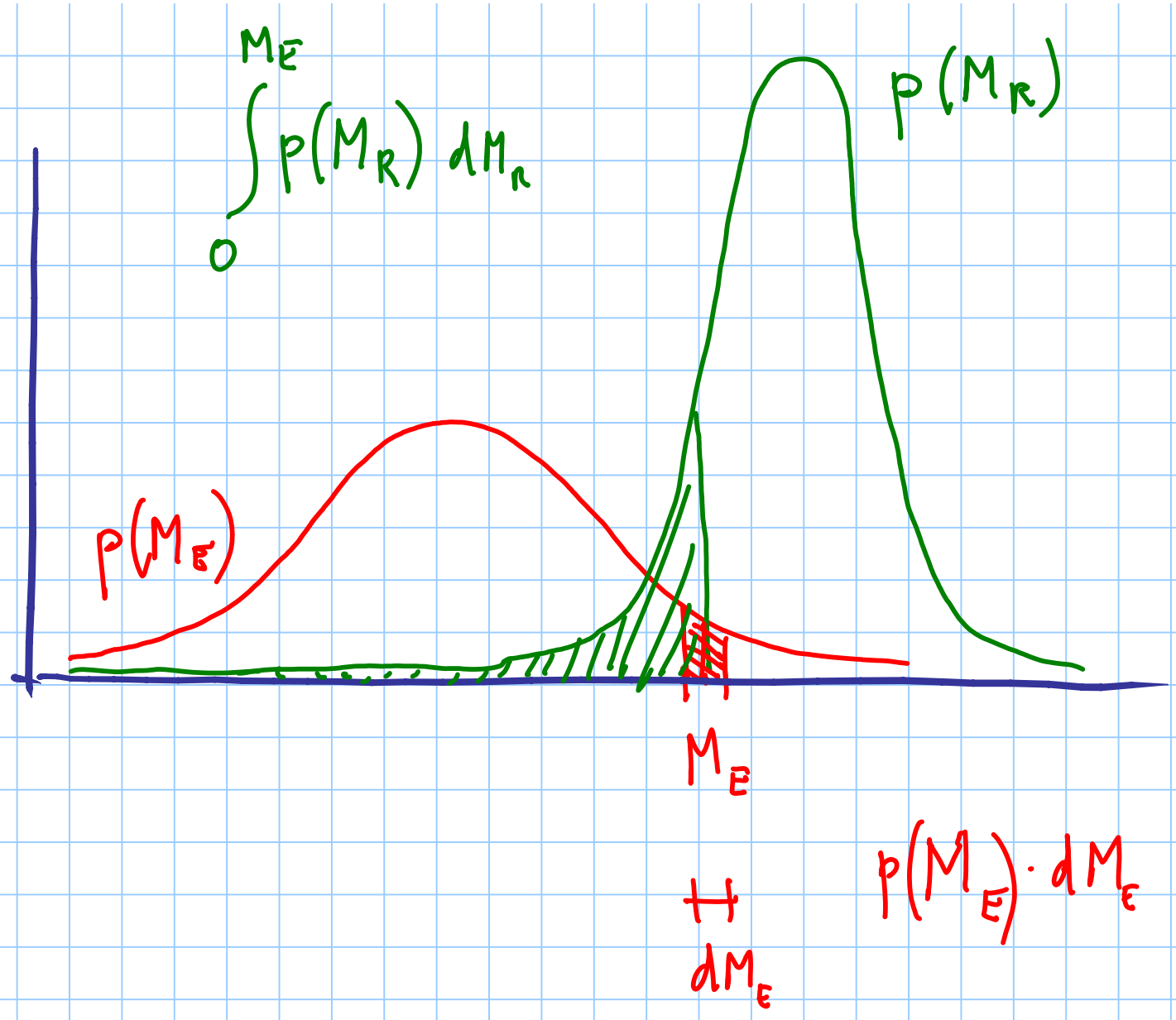


I $\quad M_u$ momento flettente di collasso

$$M_E(q_u) \leq \frac{M_{u(f_{yn})}}{\gamma}$$

$M_{u(f_{yn})}$ → comport. non lineare

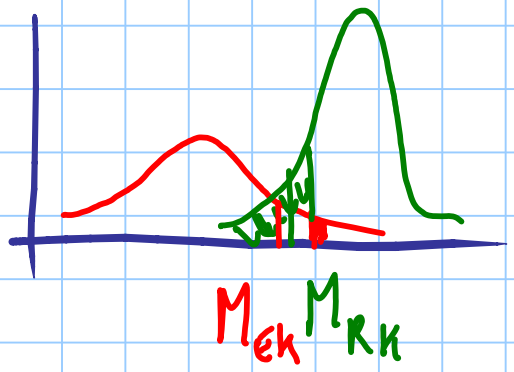
$$M_E(q_u \cdot \gamma) \leq M_n(f_{yk})$$

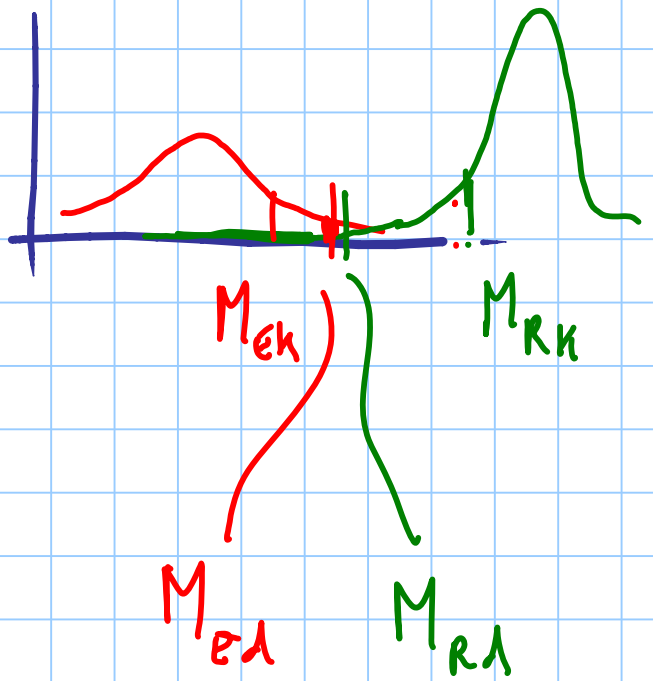

M_E
$\int_0 p(M_R)\, dM_R$
$p(M_R)$
$p(M_E)$
M_E
dM_E
$p(M_E) \cdot dM_E$

$$\int_{M_i=0}^{\infty} p(M_E)\, dM_E \cdot \int_{0}^{M_E} p(M_R)\, dM_R$$

PROBABILITÀ DI COLLASSO

3) METODO SEMIPROBABILISTICO





usare

carico	q_k	fratile	95 %
	⇓		
	q_d	fratile	99.5 % → ancora di più
resistenza	f_{yk}	fratile	5 %
	f_{yd}	fratile	0.1 % → ancora di meno

q_d f_{yd}

DESIGN ⇒ PROGETTO (calcolo)

$$q_d = q_k \gamma_q$$

$$f_{yd} = \frac{f_{yk}}{\gamma_M}$$

METODO DEI COEFFICIENTI PARZIALI

CARICHI g_k q_k

$g_1 = g_k \gamma_g$ $q_1 = q_k \gamma_q$

γ_g → 1.3 γ_q → 1.5

OGGI

RESISTENZE f_{yk}

CARP. MET. $f_{y1} = \frac{f_{yk}}{\gamma_M}$

γ_{M0} 1.05

γ_{M1}

γ_{M2} 1.25

quale legame costitutivo ?

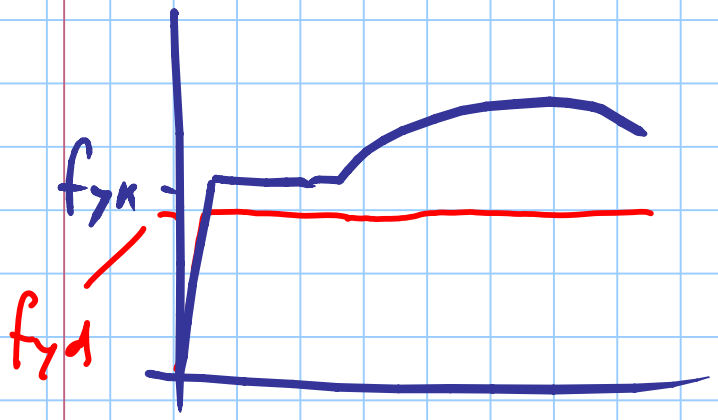
acciaio: quale f di riferimento ?

NON LINEARE

in genere f_y

$\Downarrow$

in alcuni casi f_u



$$f_{yd} = \frac{f_{yk}}{\gamma_{M0}}$$

$$f_{ud} = \frac{f_{uk}}{\gamma_{M2}}$$

) deformaz. in zona molto piccole