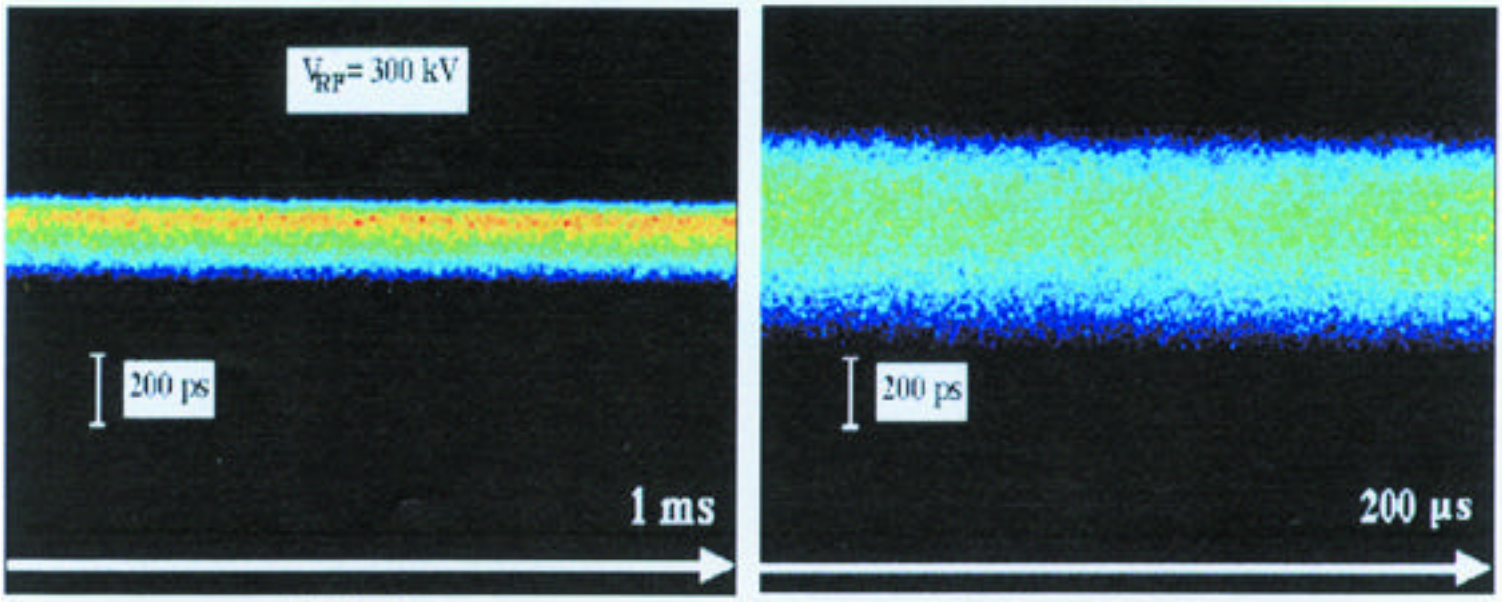
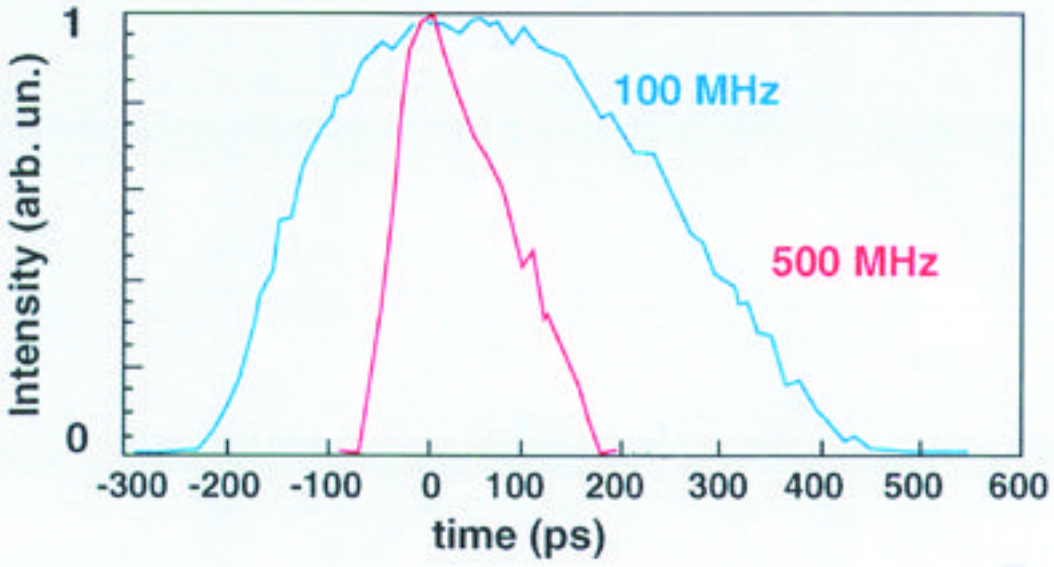
BUNCH SHORTENING WITH A 500 MHz CAVITY



WITH WITHOUT

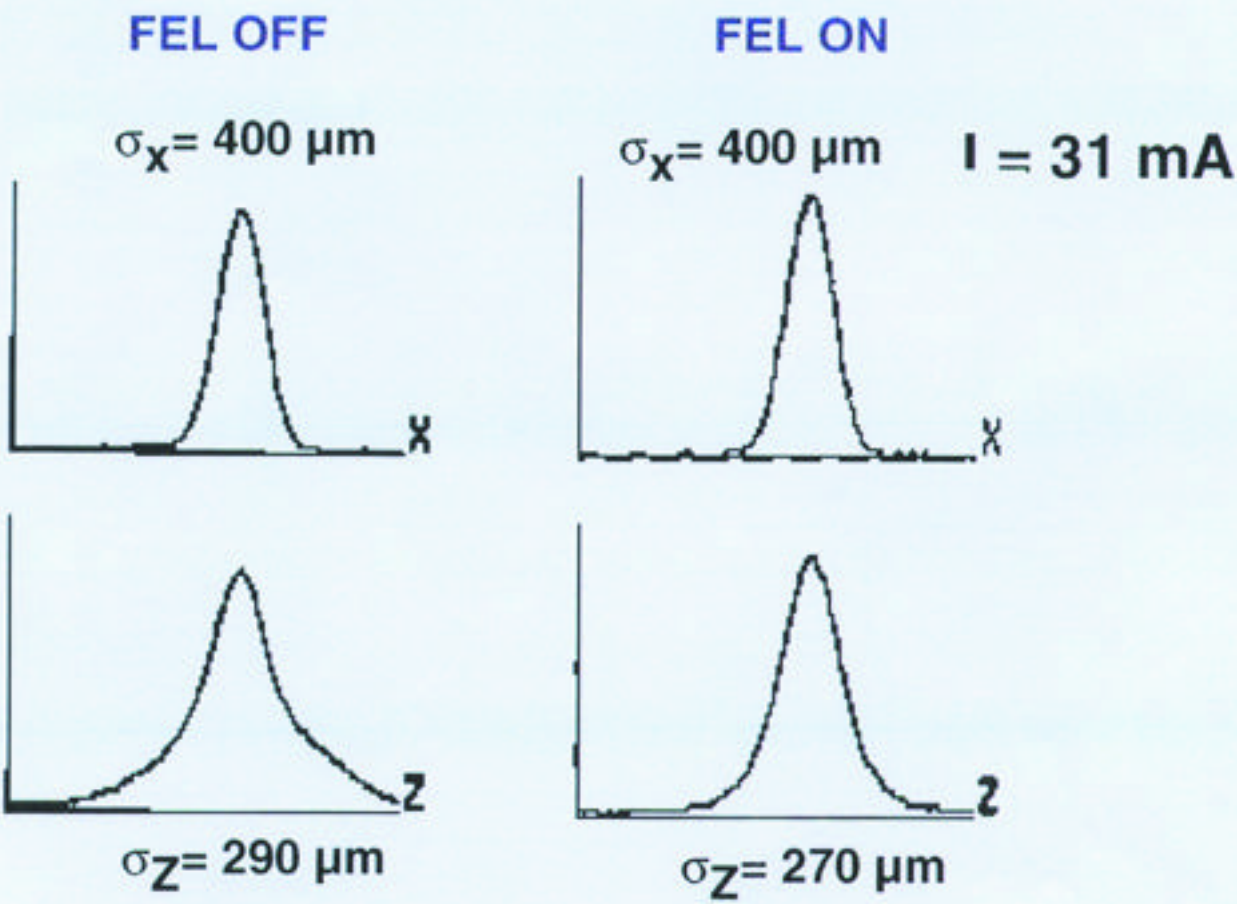
$$\sigma_{500} = \frac{\sigma_{100}}{\sqrt{1+5V_{500}/V_{100}}}$$

ASYMMETRY



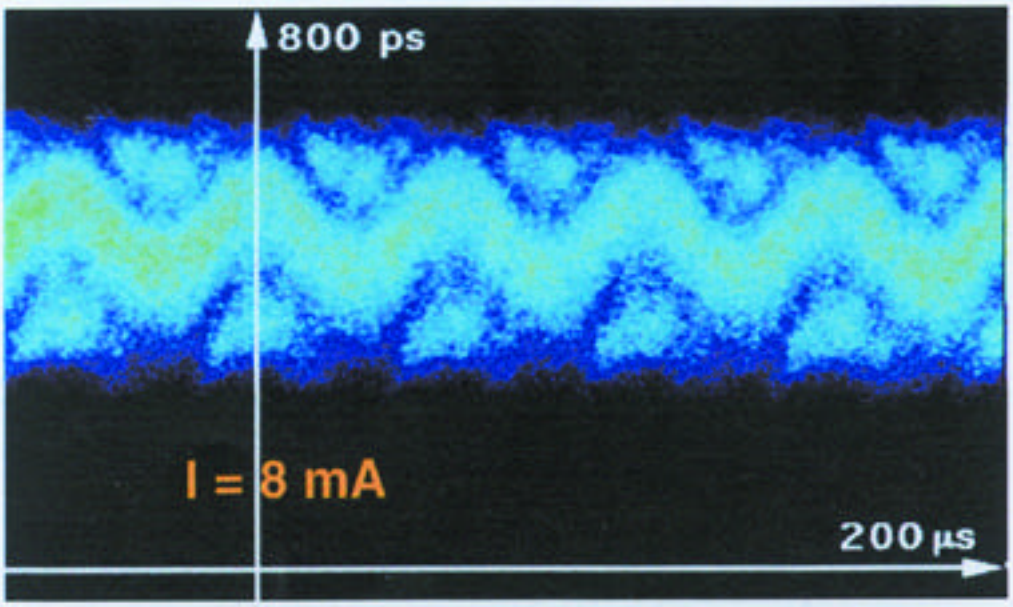
VERTICAL EXCITATION

- Can be damped by an increase of the chromaticity
- Reduction of the vertical size induced by the FEL

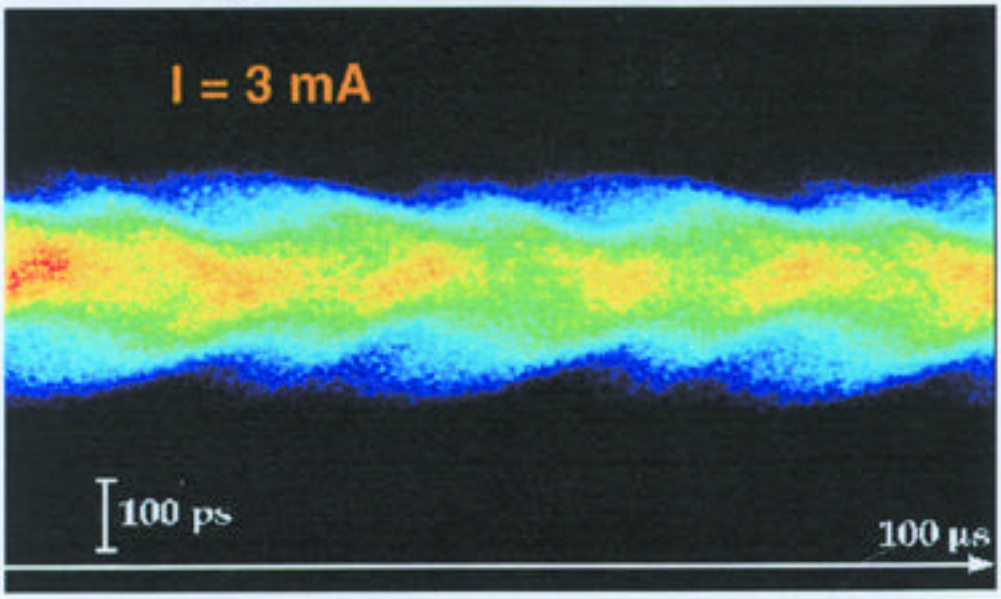


- Model of head-tail instability (G. Dattoli)

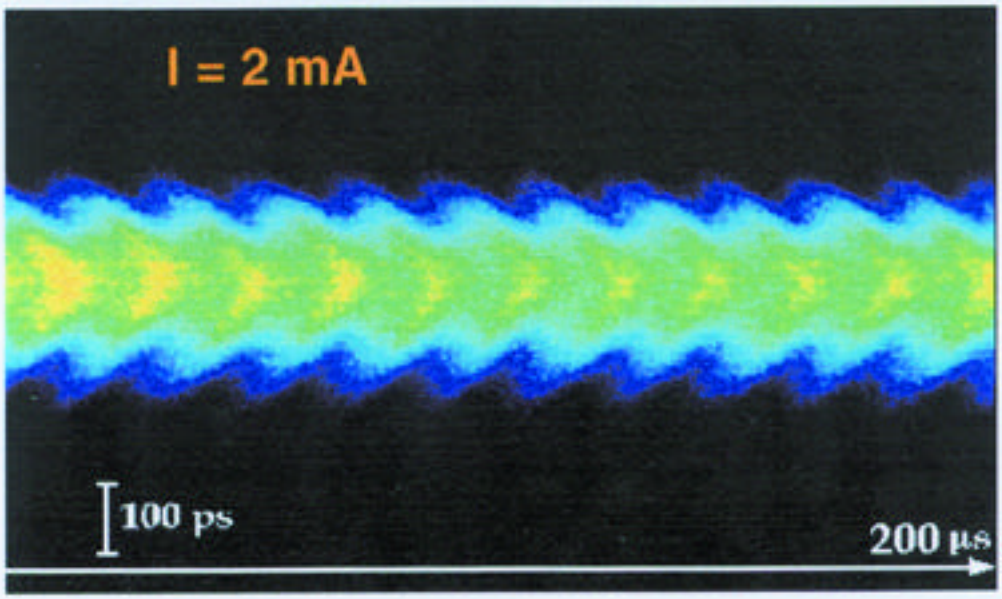
PERMANENT EXCITATIONS AT LOW CURRENT



dipolar oscill.
"jacquard mode"



dipolar oscill.
of one part
of the e bunch



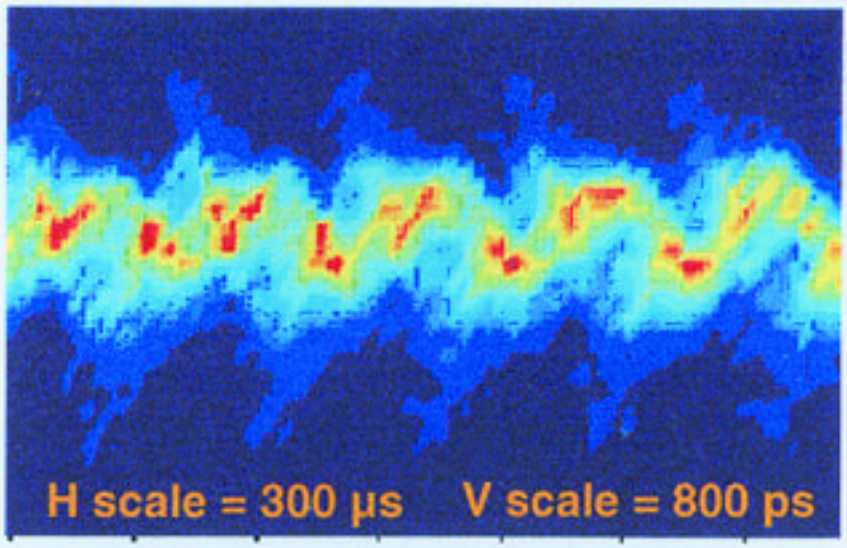
oscill. at 54 kHz
44% of
modulation

SIMULATIONS

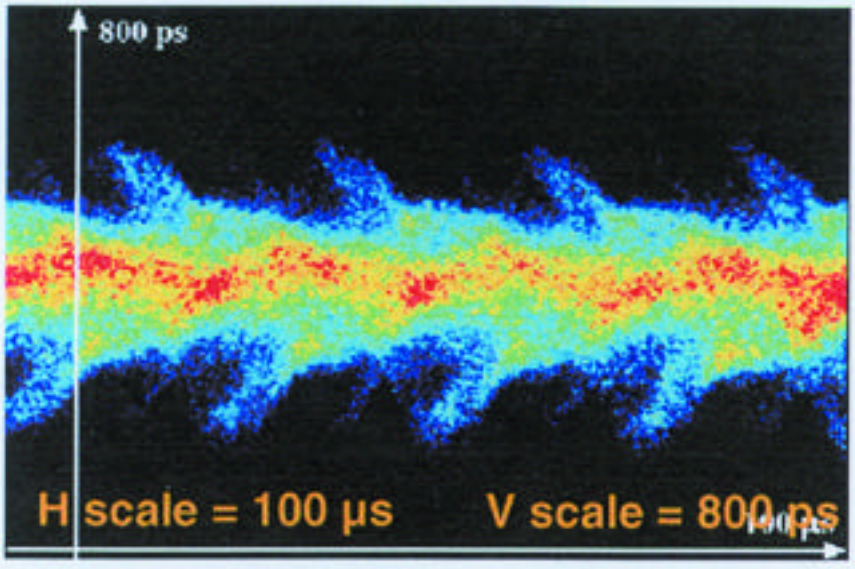
$$\tau_{n+1} = -\alpha\, T_o\, \varepsilon_n$$

$$\varepsilon_{n+1} = a \sin(\omega_{rf}\, \tau_{n+1} + \phi_1) + b \sin(5\omega_{rf}\, \tau_{n+1} + \phi_5)$$

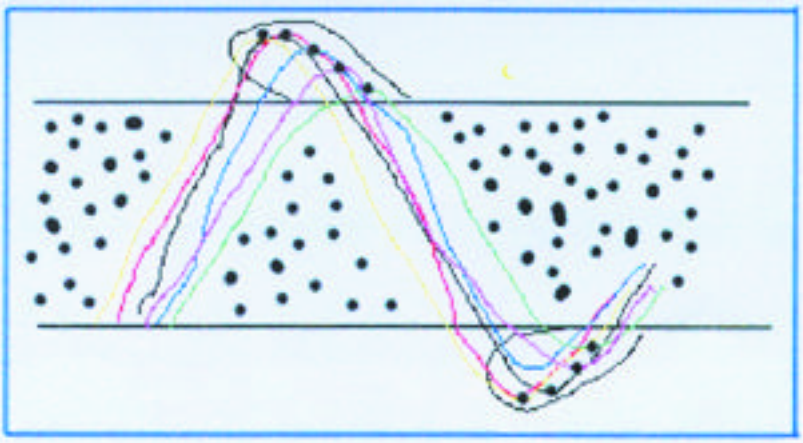
$$- U_{rad} - 2T_o\varepsilon_n/\tau_s + \delta u_{ran} + reac(\tau_n) + c\sqrt{I} \sin(\omega_{las} + \phi_1)$$



"fish bone instability" simulation : RC model of Z

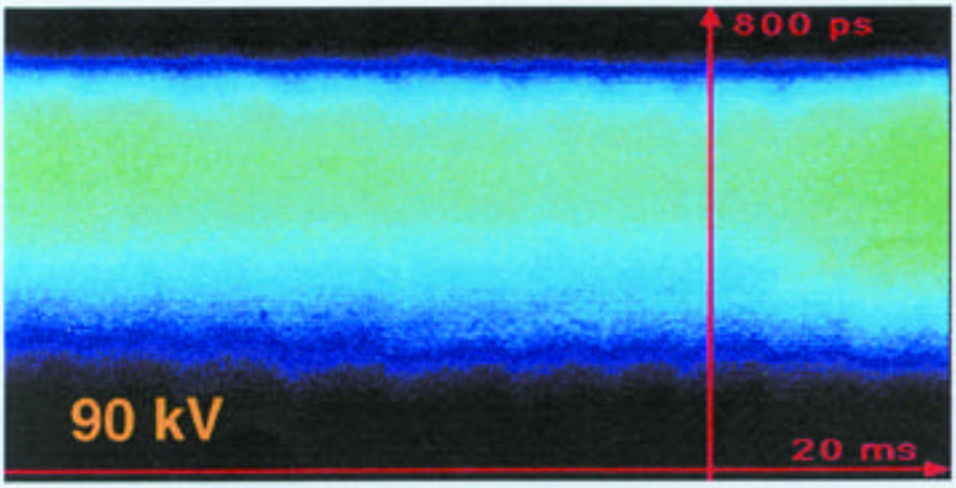


"fish bone instability" measurement



interpretation

SAW TOOTH INSTABILITY



t_{rise}= 0.4 ms

t_{fall}= 21 ms

freq. = 100-300 Hz