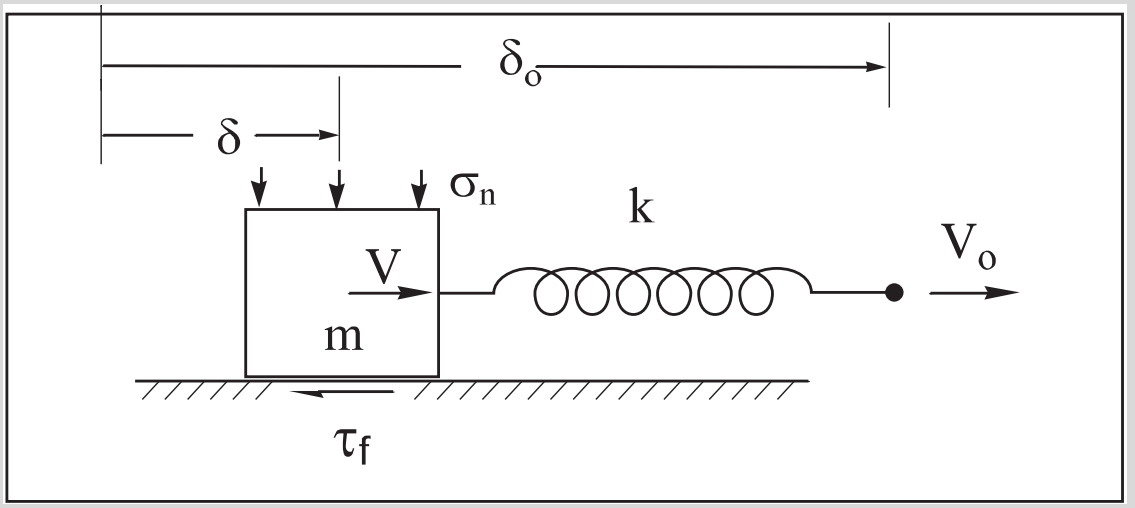

1 – D Spring – slider
model

Numerical Method: RK SS



$$m\ddot{\delta} = k(\delta_O - \delta) - \tau_f + \Delta\tau, \quad \Delta\tau(t) \text{ perturbazione}$$

τ_f = resistenza di attrito

Reologia: attrito rate- and state-dependent

θ (Φ) = variable di stato della superficie, $V = \dot{\delta}$ velocità

A - Ruina-Dieterich

$$\tau_f = \tau_* + \theta + A\ln\left(\frac{V}{V_*}\right)$$

$$\frac{d\theta}{dt} = -\frac{V}{L}\theta + B\ln\frac{V}{V_*}$$

B - Dieterich - Ruina

$$\tau_f = \tau_* - A\ln\left(\frac{V_*}{V}\right) + B\ln\left(\frac{\Phi V_*}{L}\right)$$

$$\frac{d\Phi}{dt} = 1 - \frac{\Phi V}{L}$$

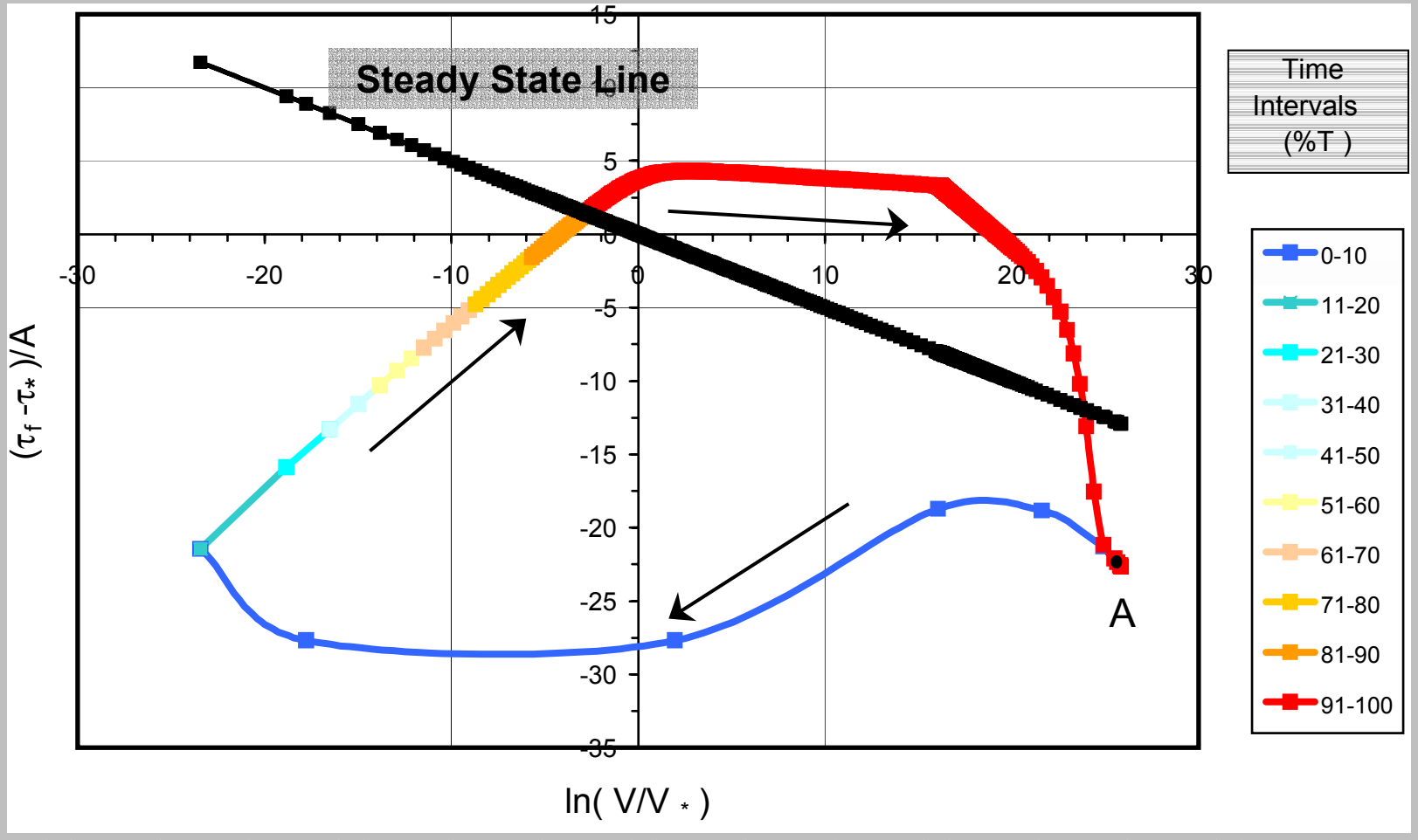
Stato del sistema: (V(t), d (t), t_f(t))

o condizioni mecc. faglia

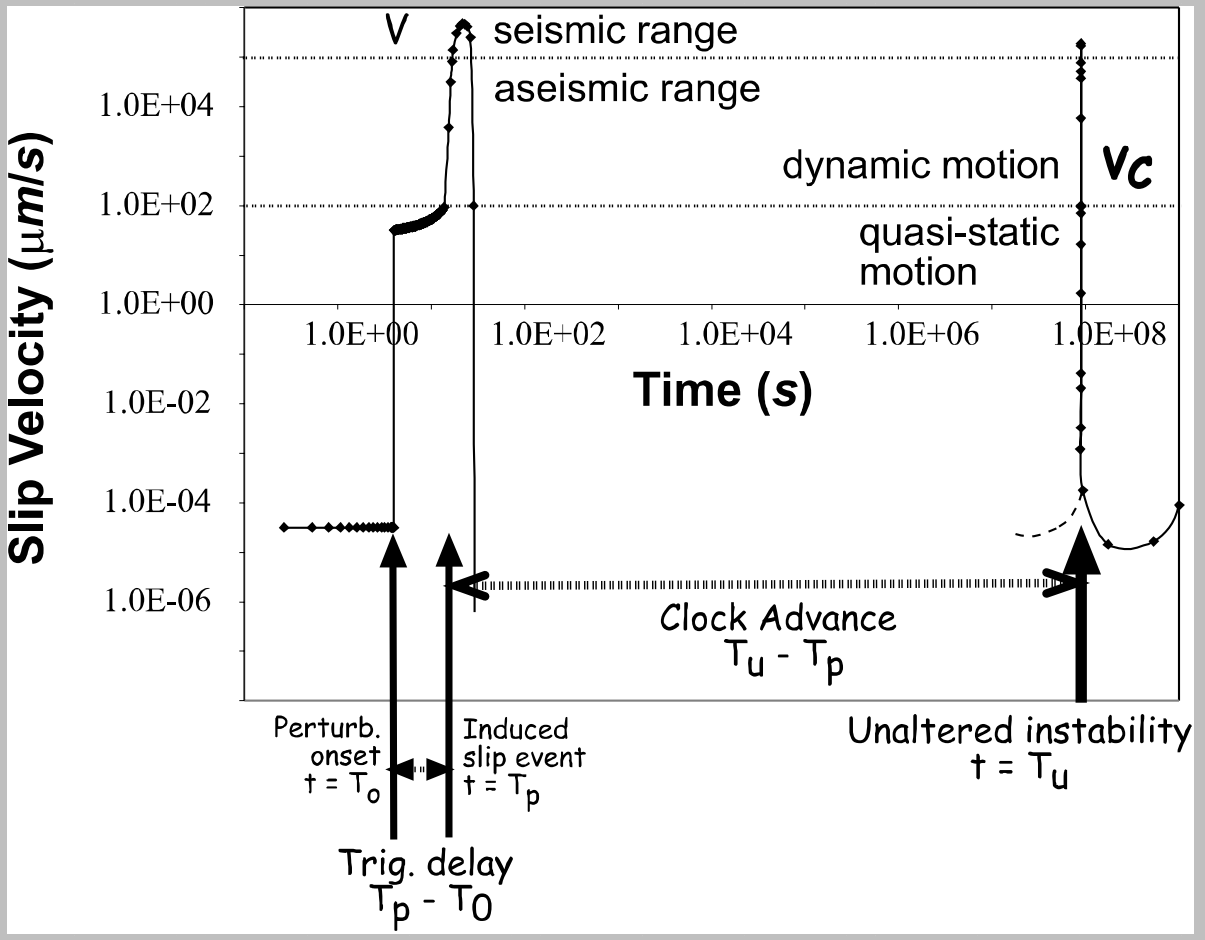
appross. q. statica (V (t), t_f(t))

V<V_C=0.1 mm/s

Fault seismic cycle modeling

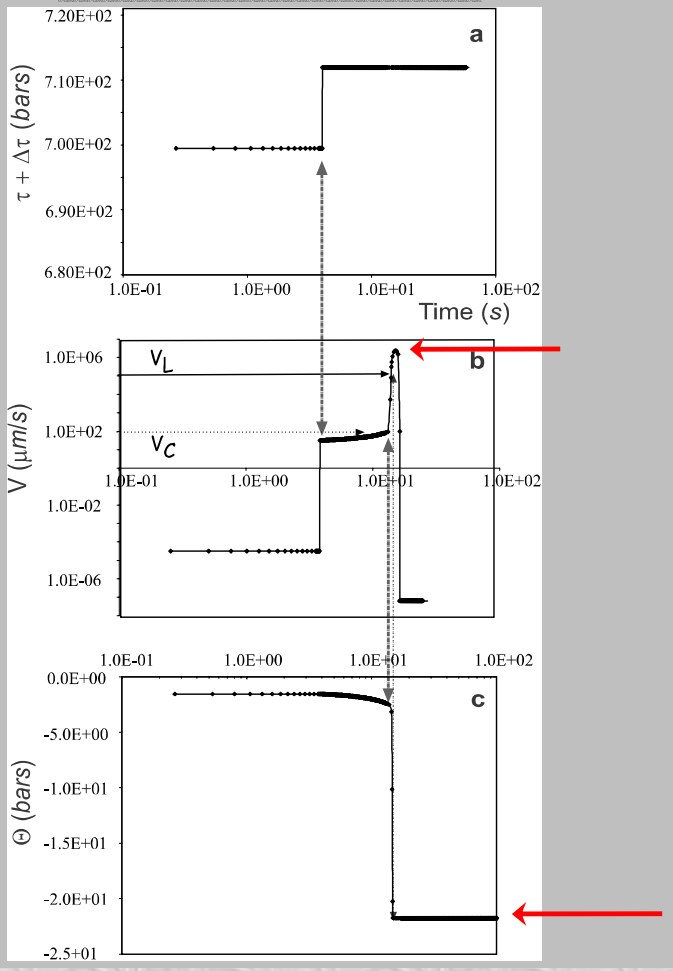


Analytical stress perturbations

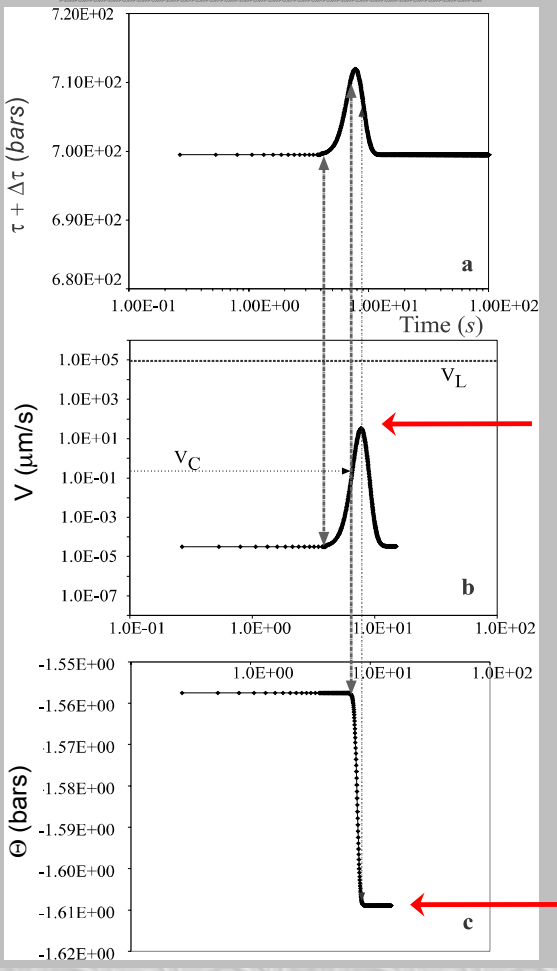


Analytical stress perturbations
The step and the pulse #1

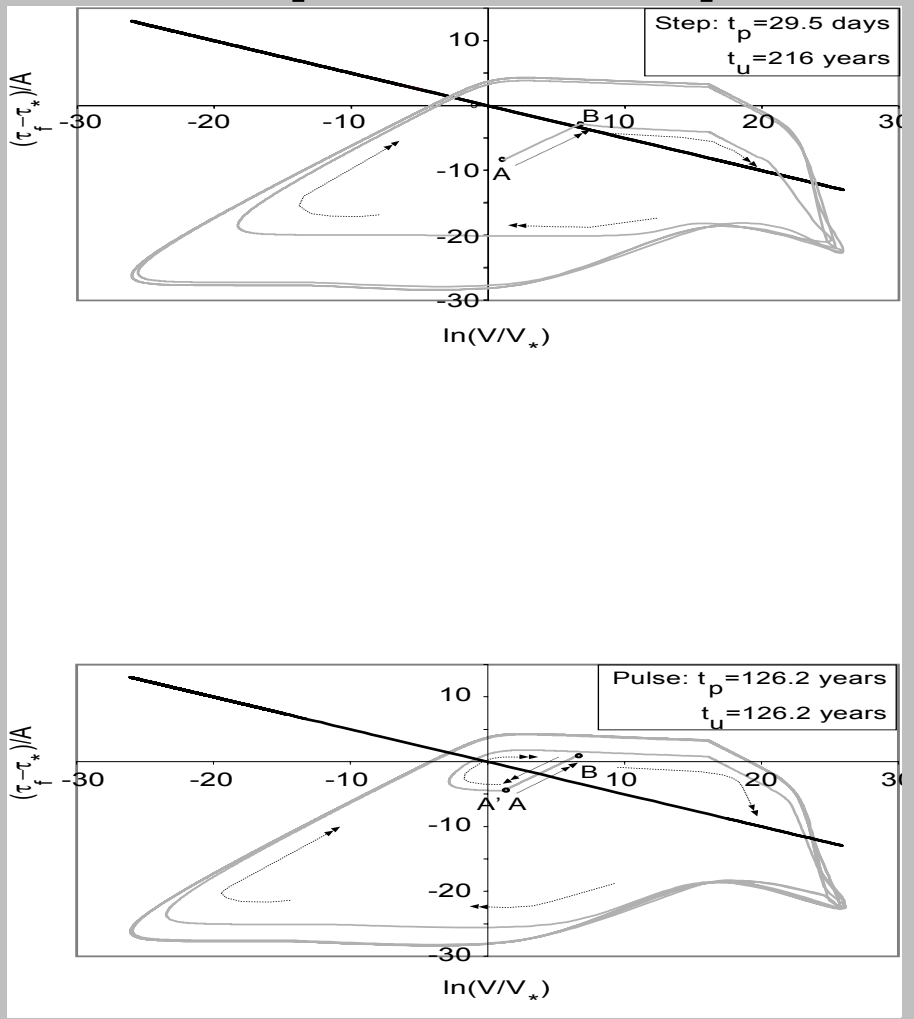
Step



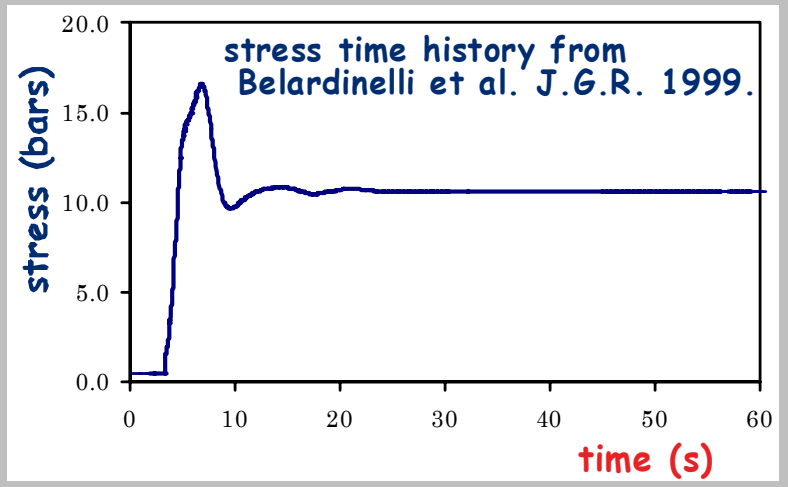
Pulse

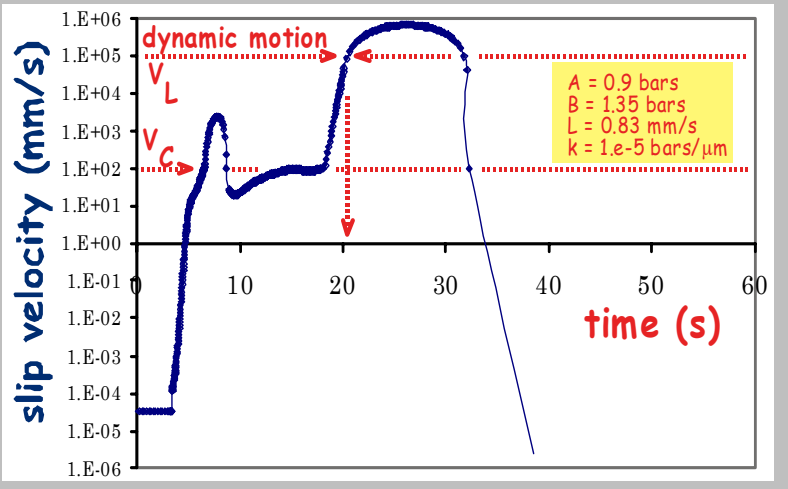


Analytical stress perturbations
The step and the pulse #2

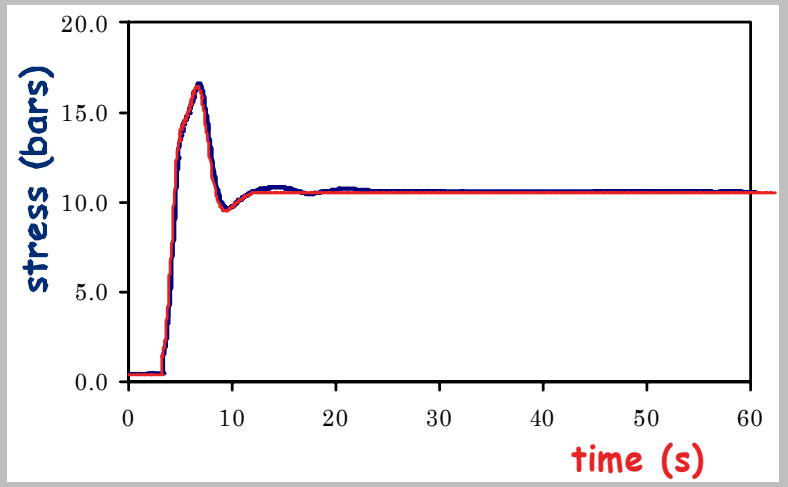


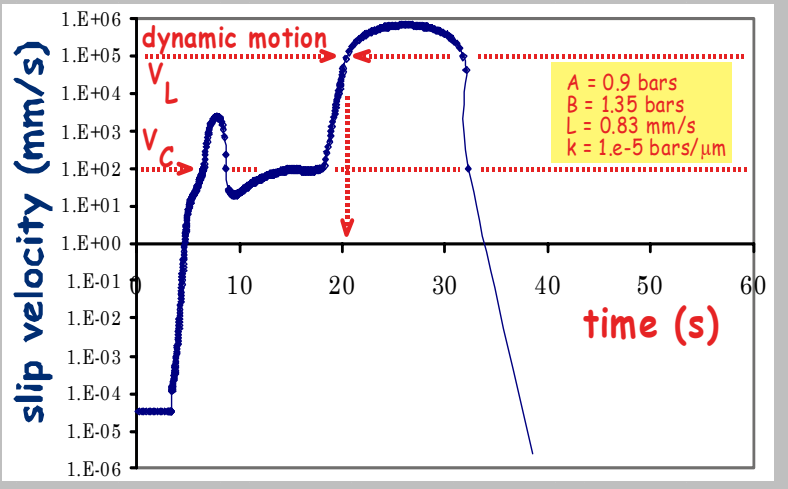
Realistic stress perturbations
Syntetic seismograms #1





Realistic stress perturbations
Syntetic seismograms #2





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