

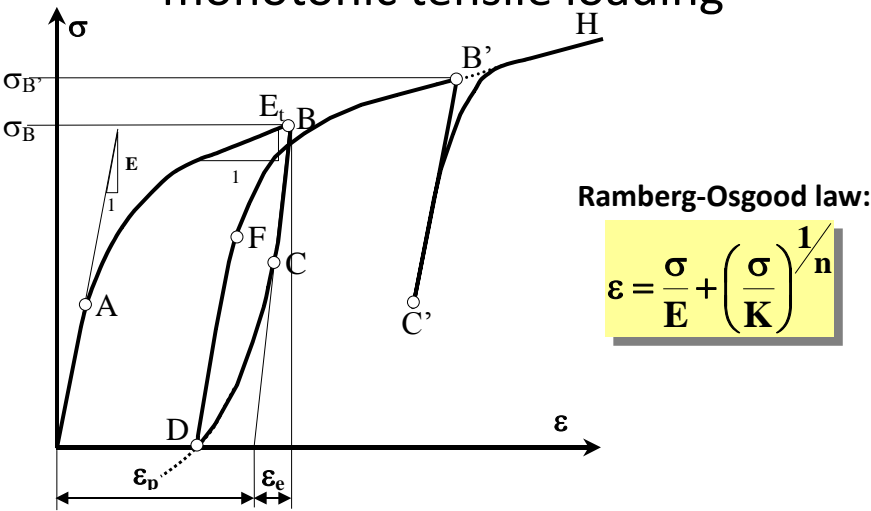


G. Hénaff

1



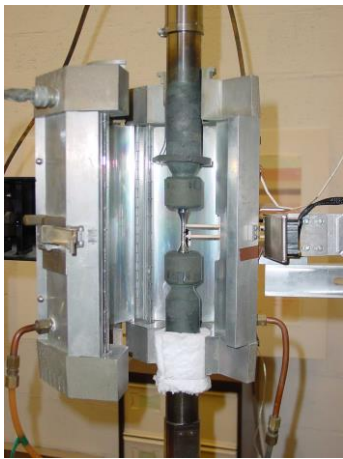
Stress-strain behaviour under monotonic tensile loading



G. Hénaff – 2016

3

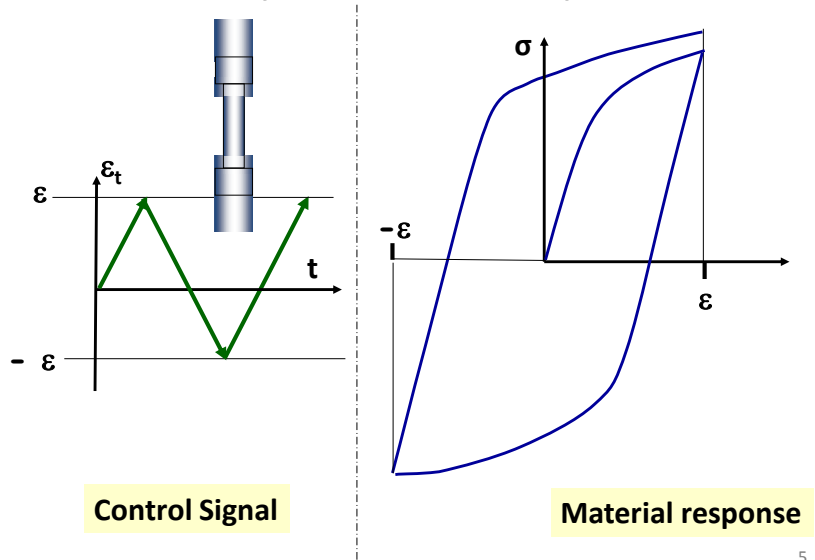
Cyclic deformation test



G. Hénaff – 2016

4

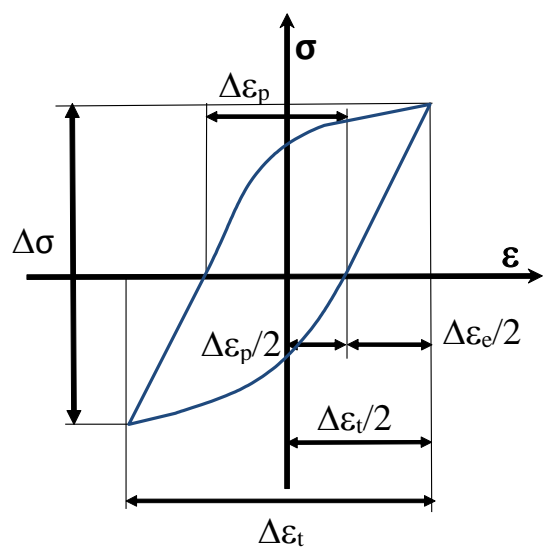
Hysteresis Loops



G. Hénaff – 2016

5

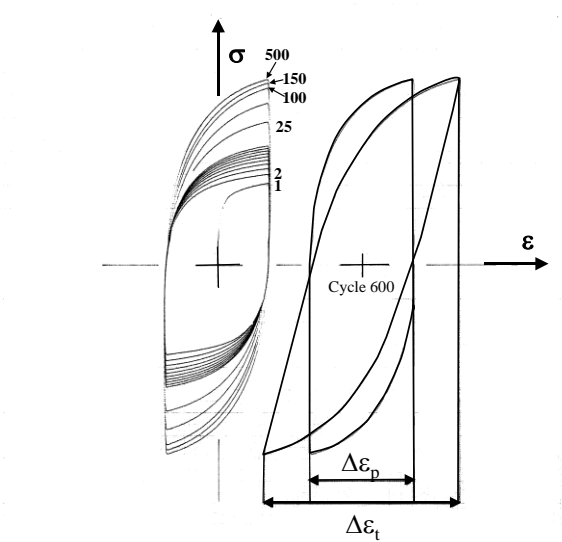
Hysteresis loop parameters



G. Hénaff – 2016

6

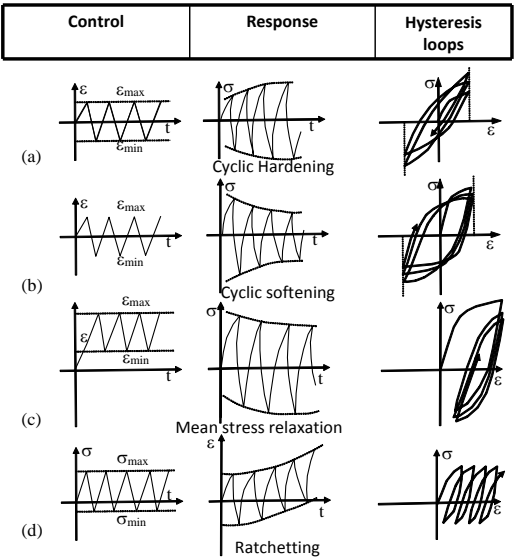
Hysteresis loops in a polycrystalline copper



G. Hénaff – 2016

7

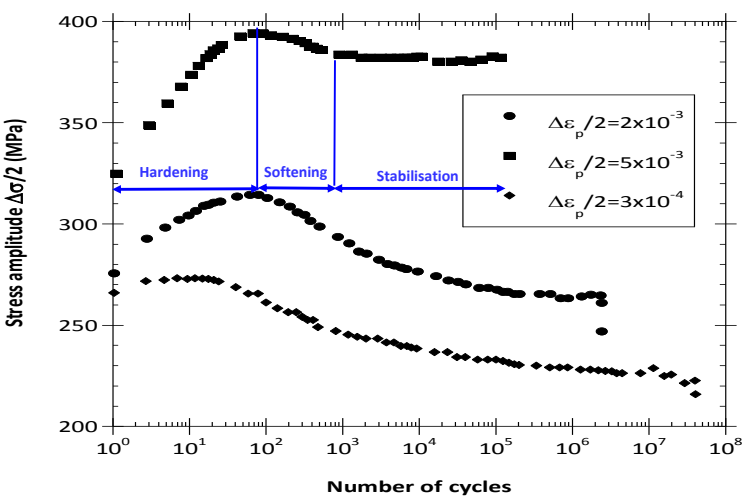
Cyclic stress-strain behaviour



G. Hénaff – 2016

8

Cyclic stress-strain behaviour of an austenitic stainless steel

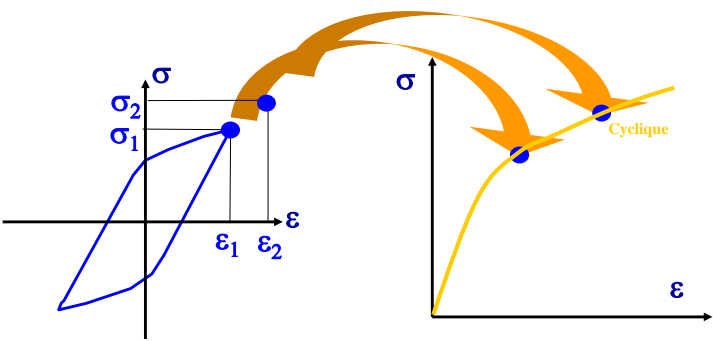


G. Hénaff – 2016

9

Cyclic Stress-Strain Curve

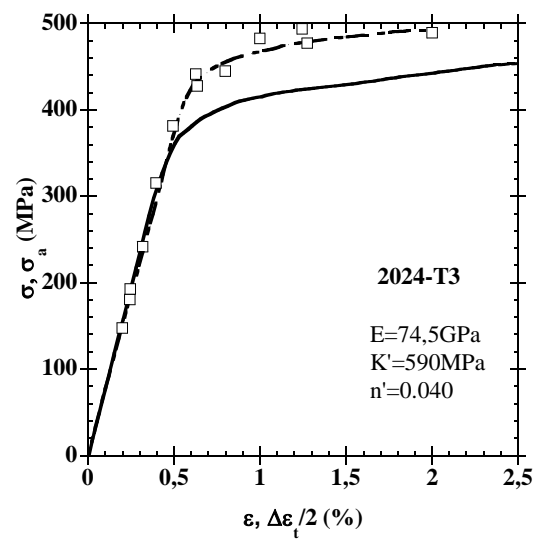
- The extrema of the stabilised hysteresis loops are plotted in a σ - ε plane for different strain amplitudes



G. Hénaff – 2016

10

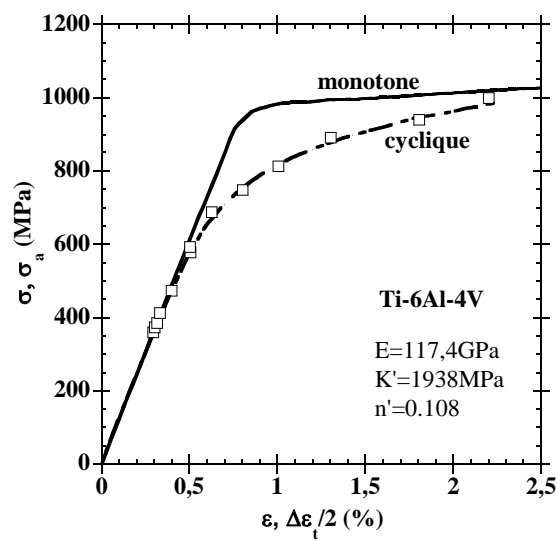
Cyclic stress-strain curve (1)



G. Hénaff – 2016

11

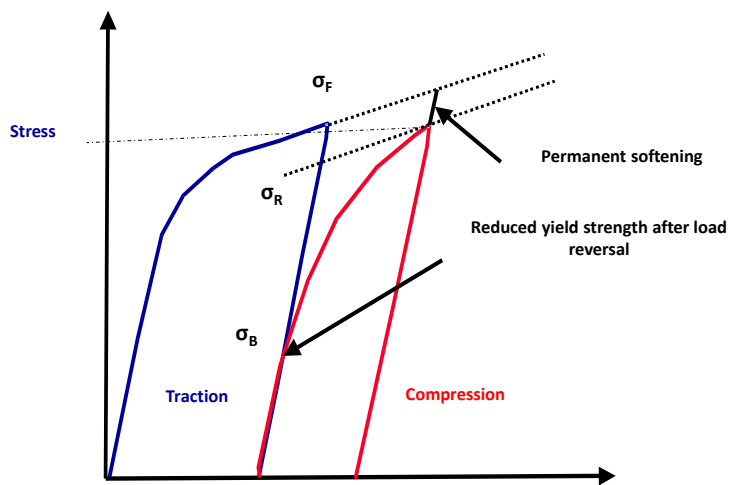
Cyclic stress-strain curve (2)



G. Hénaff – 2016

12

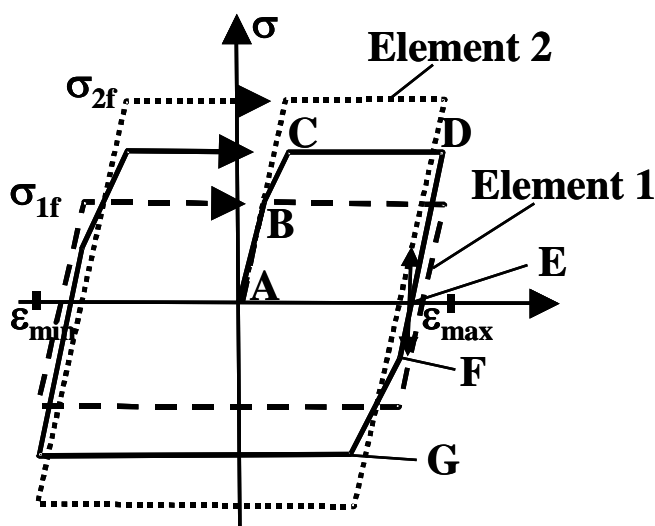
Bauschinger Effect



G. Hénaff – 2016

13

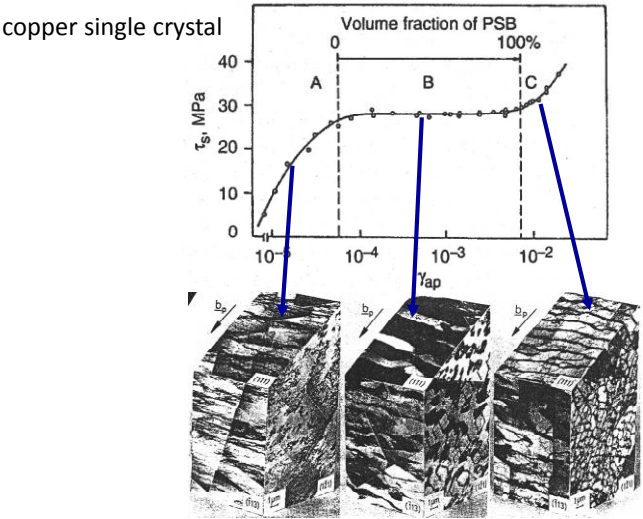
Bauschinger Effect : « composite » model



G. Hénaff – 2016

14

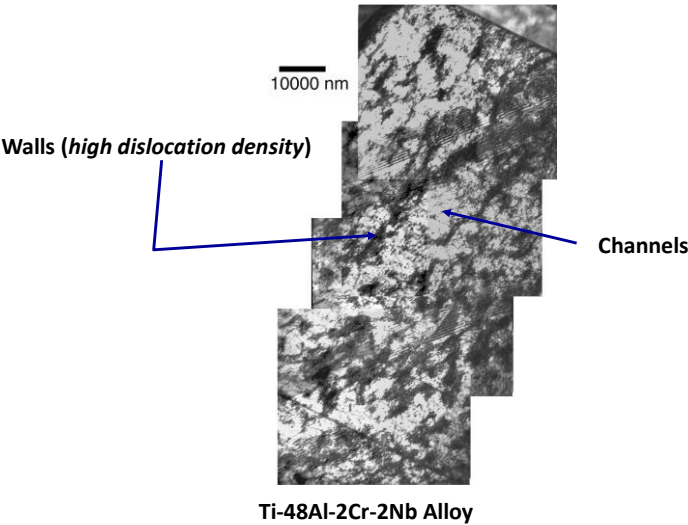
Deformation substructures



G. Hénaff – 2016

15

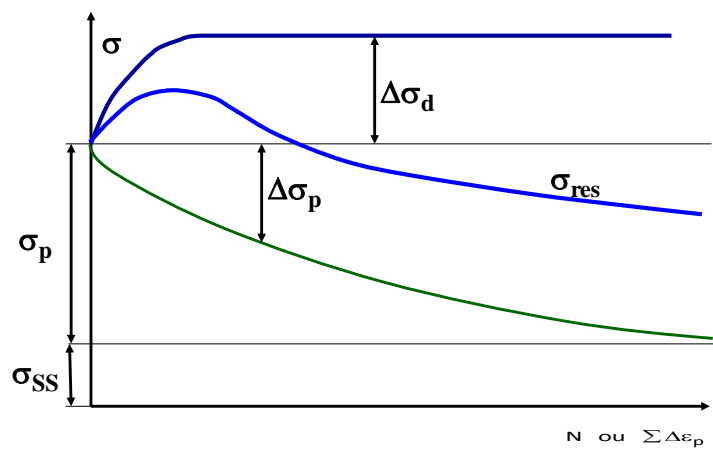
Vein-like structure



G. Hénaff – 2016

16

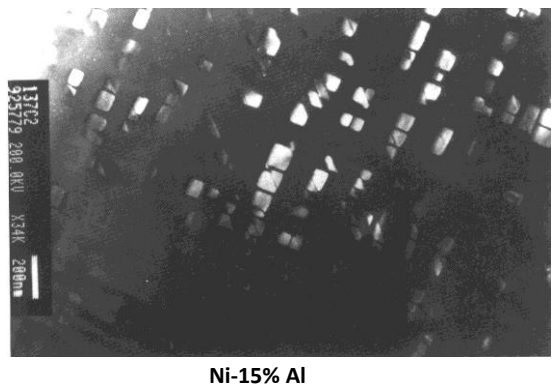
Different hardening mechanisms in precipitation-hardened alloys



G. Hénaff – 2016

17

Precipitate shearing

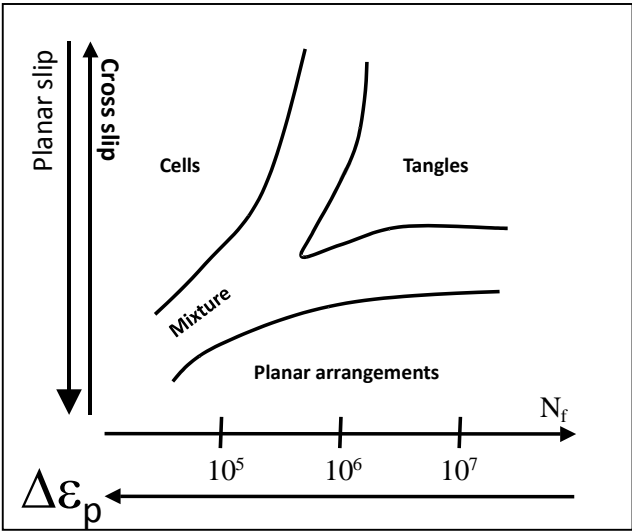


Ni-15% Al

G. Hénaff – 2016

18

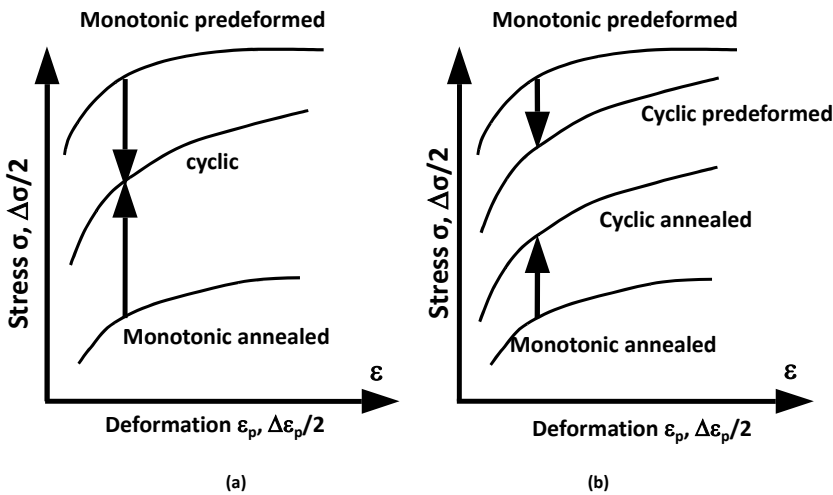
Influence of slip mode



G. Hénaff – 2016

19

Memory effect



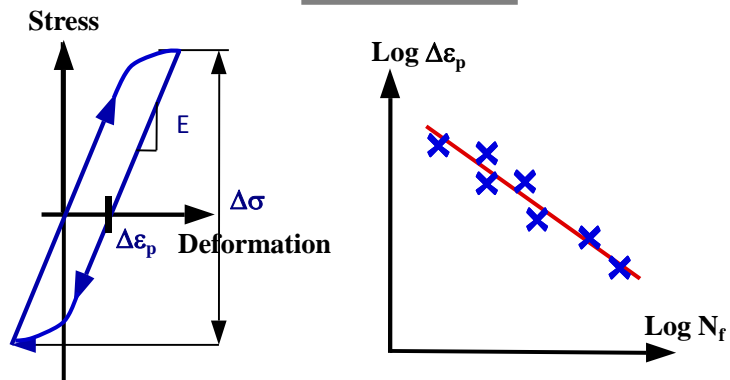
G. Hénaff – 2016

20

Low-cycle fatigue life

Manson-Coffin :

$$\frac{\Delta \epsilon_p}{2} = \epsilon'_f \times N_f^c$$



G. Hénaff – 2016

21

Energy approaches

$$W_p = \alpha \times N_f^\beta$$

↓
Loop area

G. Hénaff – 2016

22