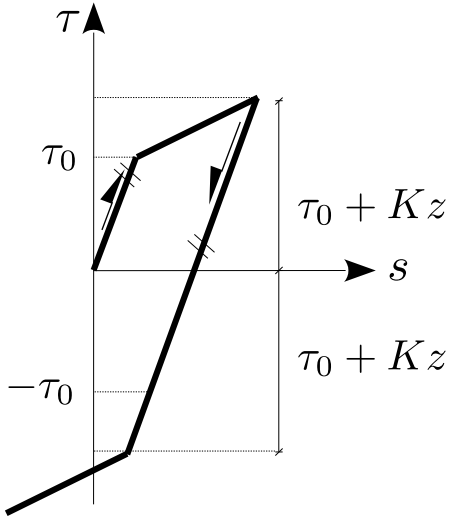
# Bond-slip model classification (unloading and reloading)

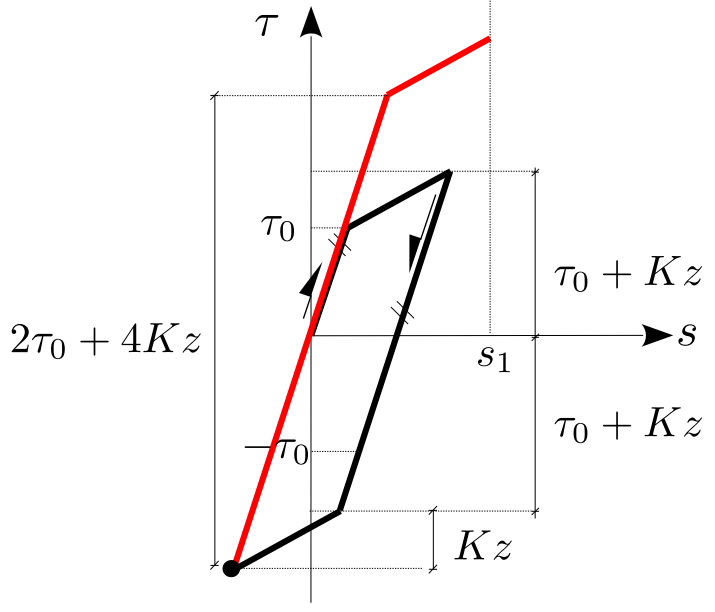
Consider the qualitative bond-slip response given in the table for loading and unloading step.
Based on the observed response, specify the type of the model (plasticity, damage, damage-plasticity) and the type of hardening if it is relevant and explain your answer.

Bond slip model (1)

Model type:
plasticity with isotropic hardening
Why?
Plasticity: inelastic slip, no reduction of stiffness
Isotropic hardening:
the elastic domain expands in both directions.

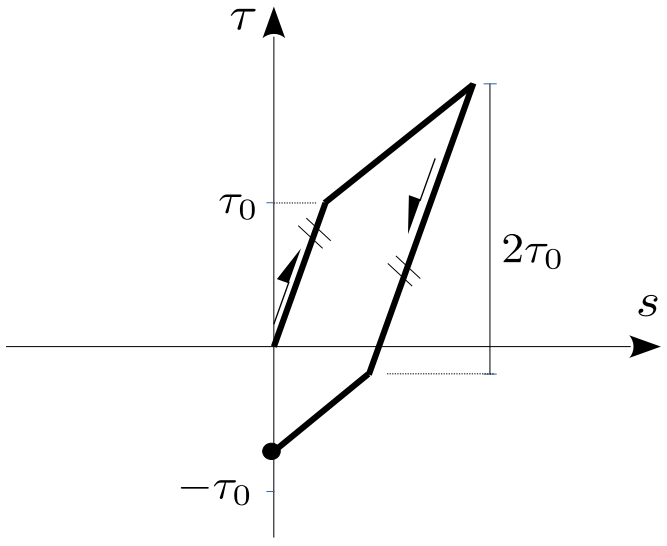
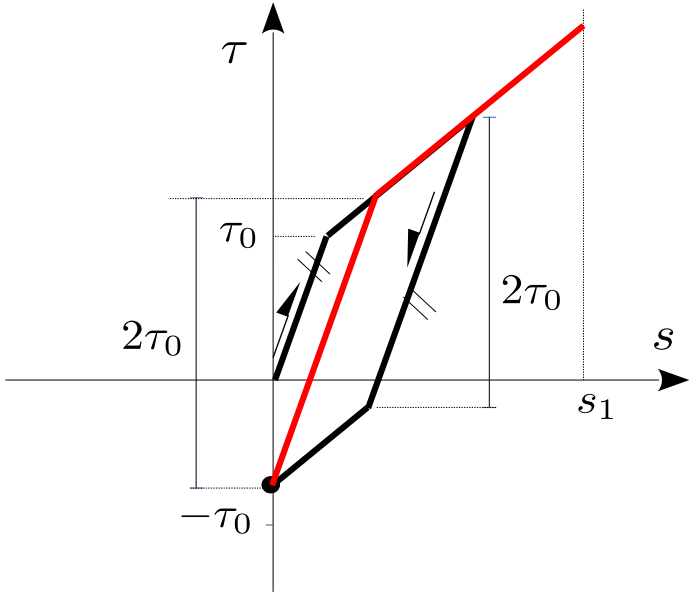



Complete the curve for reloading up to the slip $s_1$.



# Bond-slip model classification (unloading and reloading)

Bond slip model (2)

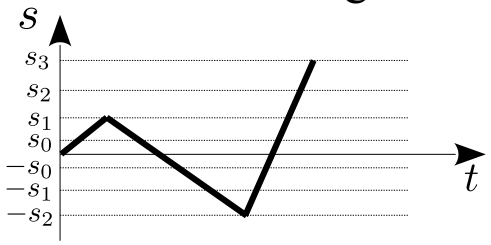
| | |
|---|---|
| Model type:<br>plasticity with kinematic hardening<br>Why?<br>Plasticity: inelastic slip, no reduction of stiffness<br>Kinematic hardening:<br>the elastic domain translates without expansion. | Complete the curve for reloading up to the slip $s_1$. |
|  |  |

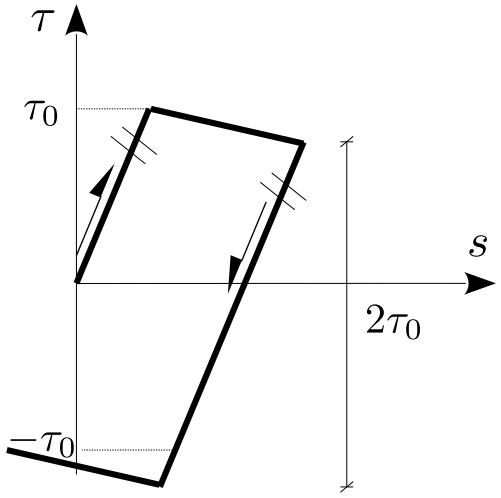
# Bond-slip model classification (unloading and reloading)

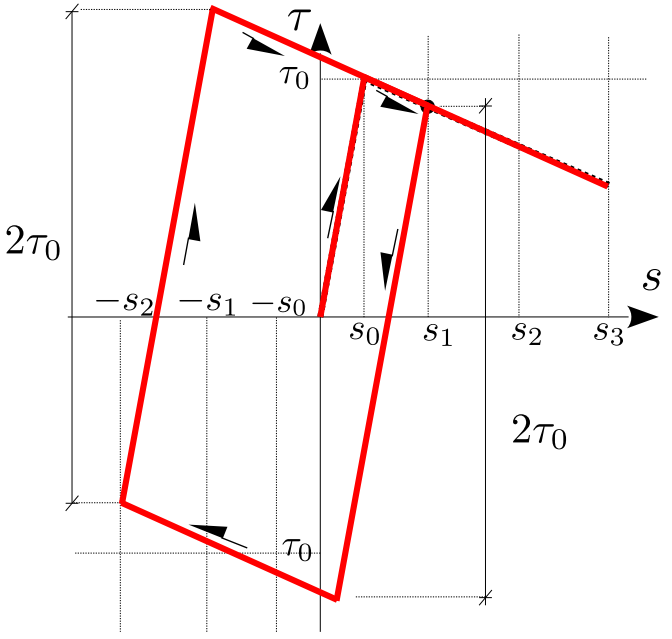
Bond slip model (3)

Model type:
plasticity with kinematic softening
Why?
Plasticity: inelastic slip, no reduction of stiffness
Kinematic softening:
the elastic domain translates without expansion..

Using the identified type of the bond-slip model, assume the bond-slip curve for monotonic loading displayed in the left diagram.
Plot the material response for the loading scenario depicted below.



# Bond-slip model classification (unloading and reloading)

Bond slip model (4)

Model type:
plasticity with isotropic softening
Why?
Plasticity: inelastic slip, no reduction of stiffness
Isotropic softening:
the elastic domain shrinks in both directions.

Using the identified type of the bond-slip model, assume the bond-slip curve for monotonic loading displayed in the left diagram.
Plot the material response for the loading scenario depicted below.