Non-saturated cyclic softening and uniaxial ratcheting of a high-strength steel: experiments and viscoplastic constitutive modeling

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Highlights

- Cyclic plasticity behaviors of 10Ni5CrMoV high-strength steel are tested at different loading conditions.
- A viscoplastic constitutive model is developed to describe the cyclic behavior of the material.
- The partitioning of cyclic softening between isotropic hardening and kinematic hardening is clarified.
- The effect of cyclic softening on uniaxial ratcheting is elucidated.
- The effectiveness of the proposed model is validated by comparing with the experimental tests.