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Non-proportional Multiaxial Ratchetting of Ultrahigh Molecular Weight Polyethylene Polymer: Experiments and Constitutive model

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Highlights

- Multiaxial ratchetting of the UHMWPE is observed.
- It depends greatly on the loading paths and is larger than the uniaxial one.
- A viscoelastic-viscoplastic model is developed to describe it.
- A non-proportional factor is introduced into the part of viscoplasticity to describe its dependence on the loading path.
- The proposed model predicts the multiaxial ratchetting of the UHMWPE well.

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