

Abstract Submitted  
for the MAR08 Meeting of  
The American Physical Society

**Cyclic deformation of polymer glasses in the yield regime by a contact method** ANTOINE CHATEAUMINOIS, CHRISTIAN FRETIGNY, ESPCI — Cyclic strains in the yield regime are characterized by a slow evolution of the mechanical response of polymer glasses toward a poorly understood stationary state. In this study, the dynamics of plastically deformed polymer glasses is analysed by a contact method where a thin film is geometrically confined and sheared within a contact between two elastic substrates. As opposed to conventional mechanical testing using bulk polymers, this approach allows to investigate the cyclic plastic behavior without the complications arising from fracture. From a measurement of the lateral contact response, we have shown that the shear properties of the film can be determined both in the linear and in the non linear regime. Using this approach, the time and strain dependent shear response of polymer glasses in the yield regime will be discussed. In addition, linear viscoelastic measurements carried out after the application of cyclic yield provides information about the dynamics of plastically deformed glass and its recovery.

Antoine Chateauminois  
ESPCI

Date submitted: 02 Dec 2007

Electronic form version 1.4