

Abstract Submitted  
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**Non-destructive probing of mechanical anisotropy in polyimide films at nanoscale** GEORGE FYTAS, MPIP; Department of Materials Science University of Crete and F.O.R.T.H, NIKOS GOMOPOULOS, Max Planck Institute for Polymer Research, GAGAN SAINI, Department of Chemistry and Department of Materials Science and Engineering, Massachusetts Institute of Technology, MICHAEL EFREMOV, PAUL NEALEY, Department of Chemical and Biological Engineering, University of Wisconsin-Madison, KEITH NELSON, Department of Chemistry, Massachusetts Institute of Technology — The present work demonstrates the first application of Brillouin light scattering (BLS) to probe elastic excitations in highly anisotropic polymer thin films. Both the in-plane and out-of-plane longitudinal and shear moduli of poly(biphenyl dianhydride-*p*-phenylenediamine) (BPDA-PDA) polyimide were accessed by utilizing the transmission and reflection scattering geometries [Macromolecules 2007, 40, 7283/ 2009, 42, 7164]. A series of thin BPDA-PDA polyimide coatings on transparent substrates with thickness in the range of 0.1-20  $\mu\text{m}$  were explored, and no noticeable trend in elastic properties and mechanical anisotropy with thickness has been found, in conformity with earlier results. The earlier studies were restricted to thick films ( $>1.5\mu\text{m}$ ) and to the in-plane moduli.

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