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Spreading of Droplets on Viscous Polymer Liquids FLINT PIERCE, DVORA PERAHIA, Clemson University, GARY GREST, Sandia National Laboratories — Significant strides have been made in understanding the spreading of liquid droplets on solid surfaces. However from biological complexes to polymeric interfaces, the surfaces are not ideal; explicitly, the surfaces may dynamically respond as spreading takes place and the droplets may partially penetrate. Molecular dynamic simulations were carried out to investigate the spreading of liquid droplets of short chains on films of viscous polymer melts. Unlike the spreading on solid surfaces, the droplets simultaneously spread and penetrate. The degree of penetration and the magnitude of damping from the film depend on the viscosity of the underlying liquid and the relative interaction of the two constituents. At the interface with viscous films a precursor foot spreads ahead of the droplet whereas on top of less viscous interfaces, the droplets penetrate while spreading with no precursor foot. A kinetic model described the spreading of shorter chain length droplets, while a hydrodynamic model better expresses the spreading of longer chain length liquid. Supported in part under DOE contract No. ER46456.

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