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Friction: Understanding Schallamach Waves. CHARLES RAND, ALFRED CROSBY, University of Massachusetts, Department of Polymer Science and Engineering — From the dynamics of biomaterial interfaces to the interpretation of nanoscale characterization of polymer interfaces, the friction of soft polymer layers is critical to a wide range of advanced materials. In 1971, Schallamach discovered that friction of soft, elastomeric interfaces is often dominated by the onset and propagation of elastic instabilities in the form of surface waves¹. Although significant contributions have been made, the fundamental relationship between the polymer structure and Schallamach waves has not been established. We present our results on the development and propagation of Schallamach waves at model, soft interfaces using a custom-built instrument. Our goal is to decouple the interfacial and bulk contributions to the onset and propagation of these friction-dominating waves. Using interfaces of polydimethylsiloxane and fused silica, we observe critical transitions in the behavior of Schallamach waves and develop qualitative models to link these transitions to interfacial properties. (1)Schallamach, A.;Wear 1971,17, 301-312.

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