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Polymer/Nonpolymer Interactions and Apparent Wall Slip During Flow at High Stresses: An Historical Perspective

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The no-slip boundary condition is a valuable empiricism derived from 19^{th} Century experiments on low molar-mass liquids. Data that suggest deviations from the no-slip condition have long been available, but convincing evidence came only through experiments with entangled molten polymers, where the molecular scale over which slip might occur is large enough to result in macroscopic effects. The mechanisms for apparent slip in entangled polymers remain unclear; there is evidence to support both adhesive failure at the melt/metal interface and cohesive failure within the entangled melt. This talk will provide an historical overview and address critical experiments.