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**Viscosity measurements of nanoscale liquid films** EDWARD KRAMKOWSKI, DAVID WILSON, Wayne State University, SHAH KHAN, University of Peshawar, ASHIS MUKHOPADHYAY, PETER HOFFMANN, Wayne State University — Measuring the viscosity of nanoscale films of liquids can be quite challenging. This difficulty has resulted in contradictory claims regarding the change in viscosity upon nanoscale confinement of liquids. Recently, we showed through a careful analysis, that in weakly interacting liquids, such as non-polar oils, the viscosity seems unchanged from the bulk value even under extreme confinement down to just a few molecular layers. Moreover, above a critical shear rate, shear thinning is observed. These measurements also have practical significance, in that traditional methods for characterizing the viscosity of solutions, while accurate, require the use of a few grams of the material being investigated. As the production methods of prototype materials becomes more costly, devising techniques that can accurately measure physical properties with much smaller volumes of material would be highly desirable. To this end, we aim to design a quick, reliable, and cost-effective method of measuring viscosity through the use of an atomic force microscope, which requires only nanograms of the sample being tested. Here we will introduce preliminary results, comparing the AFM-determined viscosity with values attained through the use of other commonly used measurement devices.

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