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Summer 2000 Participant



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### Mechanical Properties Determined by Macroindentation

Load and displacement measurement during indentation provides a method of calculating material properties such as modulus and hardness without direct observation of the contact impression. This method is useful for evaluation of mechanical properties especially for small-scale indentations where direct observation of the residual impression is difficult or impossible. In this work, previously developed “nanoindentation” techniques capable of deconvoluting load-displacement traces from an indentation have been extended to the macroscopic scale. Analysis at the macroscopic level will eliminate the “nano” problem of probe geometry calibration and allow for direct observation of contacts. After achieving accepted values of modulus and hardness of well-characterized bulk engineering materials such as aluminum, fused silica, soda lime glass, and sapphire, this technique will be extended to bulk viscoelastic materials and films, and eventually biomechanical materials.