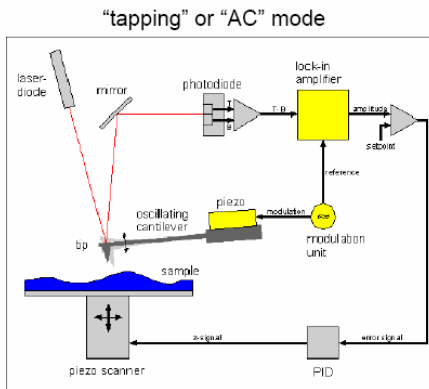


Characterization of Pressure Sensitive Adhesive Films using AFM and Nanoindentation

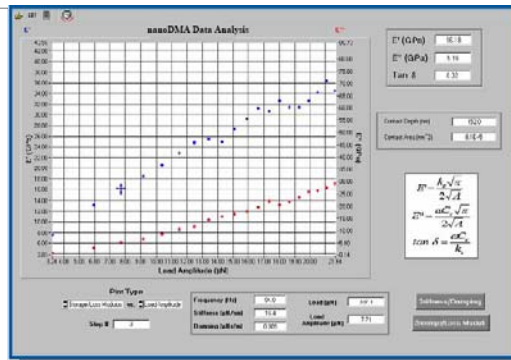
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DESCRIPTION OF WORK

- ◆ Investigating environmental variation on microstructure of pressure-sensitive adhesive (PSA) films using environmental AFM (tapping mode).
- ◆ With the Hysitron Triboindenter®, gauging global dynamic mechanical properties of PSA film, variations in properties over a narrow region (vertical & lateral) and relative changes in mechanical properties caused by defects on the order one micron.
- ◆ Characterizing dynamic mechanical properties at specific locations in the film structure.



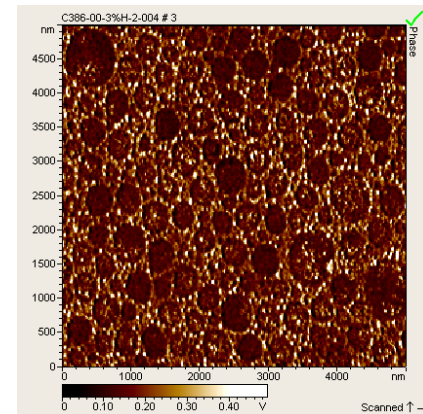
Feedback system for imaging via intermittent force



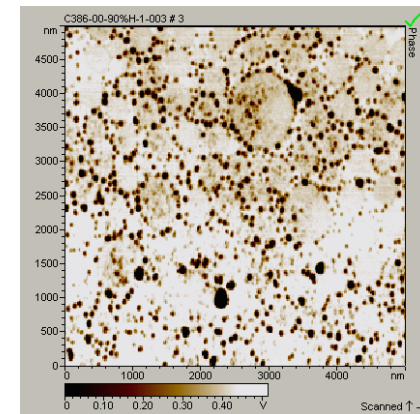
NanoDMA data from a typical test on a polymer film

MAJOR OBSERVATIONS

- ◆ Microstructure and viscoelastic properties of waterborne PSA films are sensitive to variations of moisture.
- ◆ Distribution of additives used to synthesize and facilitate the coating of PSA are retained in the adhesive films. The concentration and distribution of these chemicals changes with exposure to moisture, which influence the performance and environmental impact of the PSA.
- ◆ NanoDMA technique shows promise for characterizing the dynamic mechanical properties of adhesive thin films, which are difficult to obtain with a conventional rheometer.



3%



90%

Phase images of PSA film exposed to high and low relative humidity levels