

**SHEAR FORCE & DYNAMIC MODE AFM.**

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We have built an atomic force microscope which can be used in both shear force and dynamic modes based on a  $\sim 33$  kHz resonating quartz crystal tuning fork. For Shear force interaction tapered optical fibre probes similar to those used for SNOM are attached to the tuning fork and oscillated in a plane parallel to the sample surface. The amplitude of oscillation of the fibre has been measured through the use of a laser scanning vibrometer, giving a mechanical response of 0.5 nm/mV of applied drive voltage at resonance. In dynamic mode AFM, a silicon cantilever is attached to one tine of the tuning fork and oscillated normal to the sample, here the mechanical response was determined to be 1nm/mV of applied drive voltage. Both AFM systems are currently being tested on a variety of different substrates including dsDNA on mica and thin silver films prepared by vacuum evaporation. Work will continue in trying to maximize the resolution of the system through the use of different probe systems with the hope of combining the AFM with a Raman spectrometer for further investigation in the near future. My poster will show some of the preliminary results obtained with a calibration grid and a thin silver film in both operating modes.