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## Integrating AFM into a QTF/SANM system

Capability to also monitor normal forces into the Shear-force Acoustic Near-field Microscopy (SANM) apparatus for better characterization of mesoscopic fluids under confinement is described. A quartz tuning fork (QTF), oriented parallel to the sample's, is still used as a shear-force sensor; an atomic force microscopy (AFM) cantilever probe attached to the QTF serves as the vertical force sensor. The much different resonance frequencies of the QTF (32 KHz) and the AFM probe (350 Khz) helps to minimize the perturbations on the measurements performed at 32 kHz.) Correlation between the normal force and SANM signal (which monitors the acoustic emission from the confined fluid) constitutes the most important outcome of this new QTF/AFM/SANM system. We pursue to identify the origin of the elastic and damping components of shear interactions mediated by fluids.

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