

Abstract Submitted  
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**Low Temperature Pressure Gauge Based on a Quartz Tuning Fork** F. M. HUISMAN, E. VAN CLEVE, University of California Irvine, D. MILLER, Harvey Mudd College, P. TABOREK, University of California Irvine — Experiments in our lab on the phases of helium films on alkali metal substrates require a low temperature in situ pressure gauge. The damping of a high quality factor (Q) mechanical oscillator is strongly affected by the background gas pressure, which can be utilized to make a pressure transducer. We have investigated this effect using quartz tuning forks with a resonant frequency of 32 kHz. The variation of the Q was measured as a function of temperature from 300 to 1K and pressure from 0 to 10 torr. A clear transition between ballistic and viscous dissipation was observed. We will discuss the linearity of the oscillators as a function of drive amplitude, the resolution of the pressure gauge and various electronic and data processing strategies for dealing with relatively low frequency oscillators with  $Q > 1$  million.

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