

**Nano-Diamond Materials for Diverse Applications:
MEMS, NEMS, Single Particle Detectors,
e-beam windows, and more**

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The nucleation, growth, and doping of nanodiamond films on various substrates including Si, poly Si, SiO₂, and various metallizations will be described along with various methods of processing into devices. These films have extraordinary properties including high Young's Modulus, thermal diffusivity, dielectric breakdown strength, mass density, secondary electron yields, fracture toughness, optical transparency, and more. An example of a MEMS resonator¹ fabricated from a boron doped nanocrystalline diamond film is shown in figure 1. This structure resonated at 27.352 kHz with a quality factor (Q) of 36,460. The results for other devices and structures will be presented.

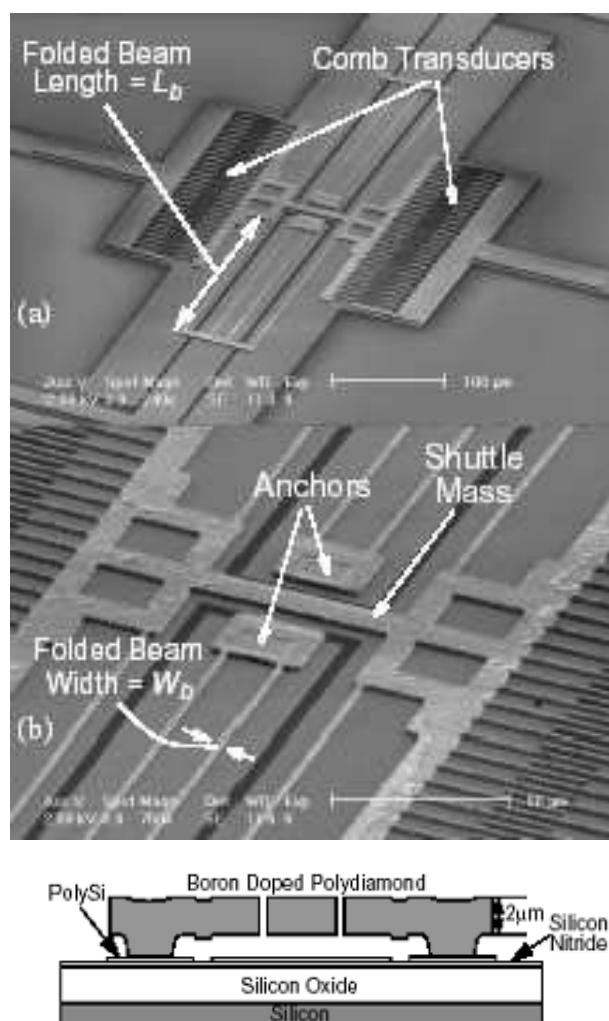


Figure 1: MEMS resonant filter fabricated from boron doped nano-crystalline diamond.

1) A collaboration with C.T.-C. Nguyen and J. Wang, University of Michigan, Ann Arbor MI USA