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An all electrical method for measuring ultra-small forces acting on nanowire oscillators SCOTT HOCH, JOHN TEUFEL, JOSHUA MONTAGUE, CHARLES ROGERS, KRIS BERTNESS, KONRAD LEHNERT — As nano technology becomes more prevalent in today's world, it is increasingly more important to understand how nanodevices, including mechanical resonators, behave in a range of environments. The purpose of this experiment is to measure small forces exerted on nanowires. The measurement is made using capacitive coupling between a high-Q microwave resonator and the aforementioned nanowire. This technique was used to successfully measure forces smaller than 0.1mirco-Newton on aluminum cantilevers. The experiment is currently being performed to measure forces on the order of 1pico-Newton exerted on Gallium-Nitride nanowires. The apparatus should provide a general, all-electrical method of measuring the motion of nanowire oscillators.

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