Abstract Submitted
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High-Q Gold and Silicon Nitride Bilayer Nanostrings[1] TUSHAR S. BISWAS, ABDUL SUHEL, BRADLEY D. HAUER, ALBERTO PALOMINO, KEVIN S.D. BEACH, JOHN P. DAVIS, University of Alberta — Nanostrings are attractive for sensing applications due to their small mass and ease of fabrication, yet very high quality factors (Q). We have fabricated and measured nanostrings from high stress silicon nitride resulting in high Q, and have discerned the dominant dissipation mechanism in our devices. This will provide a method to further improve our devices. In addition, to render our strings chemically sensitive, we decided to deposit a chemically functionalizable layer on the top of our strings. We have shown that the addition of a gold layer for this purpose does not adversely affect the Q of the fundamental mode. As an added bonus, the differences in thermal expansion between different layers make the strings sensitive to temperature changes. This enables actuation of the strings' motion using an alternating current though the gold layer, via a thermoelastic mechanism, and provides integrated actuation that averts any external actuation scheme.

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