Title:
Nanoscale cantilever for trace biomolecule detection

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ME342 project

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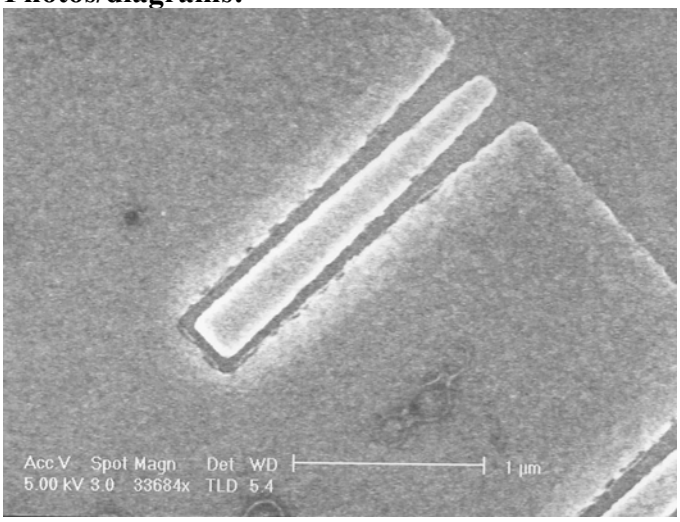
Project Abstract:
There exists great interest in the chemical sensing community to build a sensor that can detect trace levels of biomolecules with sensitivity to a single molecule. We are building a nanoscale cantilever to detect the presence of biomolecules in solution. A nanoscale cantilever would be sensitive to drag forces caused by biomolecules that are attached to a functionalized surface on the cantilever. A piezoresistive cantilever allows this mechanical signal to be read out electrically. Our process starts with a thin SOI wafer. A thin, doped epitaxial layer is deposited next. Electron beam lithography followed by reactive ion etch of silicon defines the cantilever geometry. Finally, a wet oxide etch combined with critical point drying is used to release the cantilever. We have been able to define very fine cantilever structures using e-beam lithography. We have also characterized the piezoresistivity of a very thin SOI/epi stack.

Photos/diagrams:



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