

Center for Sensorimotor Neural Engineering *PRESENTS*

“Active RF and mm-Wave MEMS Resonators Using Transistor Sensing”

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Dr. Weinstein will discuss the Resonant Body Transistor (RBT), which can be integrated into a standard CMOS process for low power clock generation and high-Q tank circuits. We recently demonstrated the first hybrid RF MEMS-CMOS resonators in Si at the transistor level of IBM's 32nm SOI CMOS process, without the need for any post-processing or packaging. The unreleased, Si bulk acoustic resonators are driven capacitively using the thin gate dielectric, and actively sensed using a body-contacted nFET incorporated into the resonant cavity. FET sensing with the high f_T , high performance transistors in CMOS amplifies the mechanical signal before the presence of parasitics. The resulting RF-MEMS resonators provide low power, low cost, small footprint building blocks for on-chip signal generation and processing.

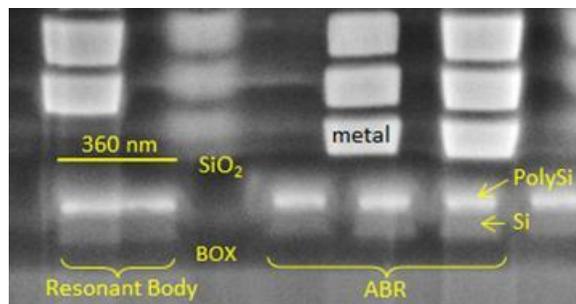
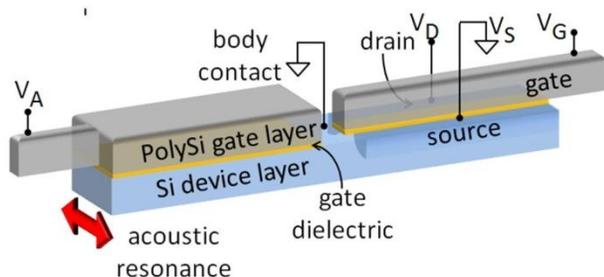


Figure 1. (left) Schematic of CMOS-integrated Resonant Body Transistor (RBT). (right) Cross section of CMOS stack showing RBT in the Si device layer. The device resonates at 11 GHz with no post-processing or packaging of the CMOS chip.

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3:30 PM – 4:30 PM

SDSU will connect via videoconference from SDSU, room E203e

Space is limited, please arrive early; contact Theresa Garcia, tgarcia@mail.sdsu.edu for questions