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Electronic Structure and Carrier Mobility in Strain-Engineered Nanostructures[1] DECAI YU, YU ZHANG, JI ZANG, FENG LIU, University of Utah — Strain engineering is a major driving force to continue the performance scaling of silicon devices. However, currently strain engineering is confined in planar hetero-structures. It is anticipated that future generation of devices may employ nanostructures and new quantum principles. Here, we present theoretical studies of strain engineered nanostructures for potential device applications. Combining first-principles and finite element calculations, we analyze the electronic band structure and carrier mobility in SiGe nanotubes and Si nanomembranes that are strain-modulated by Ge quantum dots.

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