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**Tunable Absorption Spectroscopy of Individual Nanowires**

LINYOU CAO, Department of Materials Science and Engineering, Stanford University, JUSTIN WHITE, Department of Applied Physics, Stanford University, JOONSHIK PARK, Nanomechatronics Research Center, Korea Electronics Technology Institute, MARK BRONGERSMA, Department of Materials Science and Engineering, Stanford University — The optical properties of semiconductor nanowires have recently emerged as a major topic of research largely motivated by their potential for diverse optoelectronic applications. Here we present a combined experimental and theoretical investigation showing that the absorption individual germanium nanowire is tunable over a broad region from visible to near infrared. Close correspondence between the calculated and experimental results indicates structural resonance as mechanism for the tunable absorption. Similar tunable absorption expects to be also in other nanowires as the mechanism of structural resonance is universal. The large tunability of the light absorption, along with the well-acquired synthetic controllability of nanowires , open up a new pathway for the design of high-efficiency and broadband optoelectronic devices.

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