

Sensitivity enhancement in SiGe-on-insulator nanowire biosensor fabricated  
by top surface passivation

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Abstract

The oxidation caused by Ge condensation increases the Ge fraction in a SiGe-on-insulator (SGOI) and significantly increases the hole mobility. This effect can be exploited to improve the sensitivity of SGOI nanowires. However, previous studies have found that the sensitivity of SGOI nanowires degrades when the Ge fraction exceeds 20%, because a high Ge fraction destabilises the surface state of SiGe. In this work, a top surface passivation plasma-enhanced chemical vapour deposition SiO<sub>2</sub> layer deposited on a Si<sub>0.8</sub>Ge<sub>0.2</sub> nanowire improved its sensitivity by 1.3 times that of the nanowire sample without a top passivation layer.

Keyword : top passivation layer, nanowires