Giant Geometrically Amplified Piezoresistance in Metal-Semiconductor Hybrid Resistors

We show that very high geometrically amplified piezoresistance can indeed be obtained in microstructured metal-semiconductor hybrid devices, even significantly higher amplification factors than the factor of approximately 8 demonstrated recently by Rowe and co-workers may be achieved. However, we also show that this amplification cannot be used to realize high sensitivity sensor devices due to limitation of the applied voltage across the device when the transfer resistance is smaller than the total resistance of the device. In that case, the sensitivity in units of V V⁻¹ Pa⁻¹ is always less than the sensitivity of conventional piezoresistors fabricated in the same piezoresistive material.

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