Abstracts

Microwave Point Contact Diode Responsivity Improvement through Surface Effects in Vacuum (Short Papers)

N.S. Kopeika, I. Hirsh and M. Ravfogel. "Microwave Point Contact Diode Responsivity Improvement through Surface Effects in Vacuum (Short Papers)." 1984 Transactions on Microwave Theory and Techniques 32.10 (Oct. 1984 [T-MTT]): 1384-1387.

Desorption of air atoms from point contact diode surfaces via exposure to vacuum can give rise to significant changes in electronic characteristics. In the example considered, exposure of an X-band detector to a modest vacuum gives rise to a responsivity increase of about 80 percent for video and heterodyne detection. Experiments indicate that vacuum desorption of minority surface impurities increases the barrier height and decreases tunneling probability, thus increasing diode nonlinearity and making the diodes more nearly "ideal." The resulting relative increase of the thermionic emission current should decrease the effective shot-noise temperature, thus increasing the signal-to-noise ratio (SNR) even further.

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