

## **Critical assessment of the Au/Ga/AsP and Au/GaP photodiodes as radiometry standards**

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Many applications of synchrotron radiation require an absolute measurement of photon flux. Schottky photodiodes consisting of a thin Au film deposited on GaAsP or GaP are sensitive to radiation in the extreme ultraviolet (EUV), and have been proposed for use as radiometric transfer standard detectors. A radiometric detector should exhibit high quantum efficiency, spatial uniformity, resistance to radiation induced changes, and temporal stability. While GaAsP and GaP photodiodes display high sensitivity, good uniformity, and resistance to radiation damage, they suffer from temporal instability. Results presented in this paper indicate that the quantum efficiency of GaAsP and GaP photodiodes degrades in the region from 50 nm to 254 nm during normal storage. This loss of sensitivity is not substantially affected by ambient humidity, and may be accelerated by heating the device. While useful as detectors, Au/GaAsP and Au/GaP Schottky photodiodes are not suitable for use as transfer standards in this spectral region, and may not be suitable for other applications where detector efficiency must be stable over periods longer than a few days.