

## Homo- and heterostructures based on the binary and ternary alloys of antimonide group semiconductors

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**Focal plane arrays (FPAs) detecting radiation in the medium-wave infrared (IR) range (MWIR) based on the antimonide group materials with absorber layers  $InSb$ ,  $Al_xIn_{1-x}Sb$  or  $InAs_{1-x}Sb_x$ , including XBn-structures with  $AllnSb$  barrier layer ( $InSb/AllnSb/InSb$ ) and XBn-structures with  $AlAsSb$  barrier layer ( $InAsSb/AlAsSb/InAsSb$ ) have been developed and investigated. Various topology photosensitive elements (PSE) with absorbing layers  $InSb$ ,  $Al_xIn_{1-x}Sb$  or  $InAs_{1-x}Sb_x$  were fabricated. It is shown that wide-band ternary alloys  $AllnSb$  or  $AlAsSb$  are considered as an alternative to the narrowband binary compound  $InSb$ , since, due to wide-band material properties, photodiodes have lower dark currents, and, consequently, noise. The average values of detectivity  $D^*$  and noise-equivalent temperature difference (NETD) have been measured for various topology photodetectors, so  $D^*$  was more than  $10^{11} \text{ cm}^2 \text{ W}^{-1} \text{ Hz}^{-1/2}$  in homostructures, and  $D^*$  exceed of  $10^{12} \text{ cm}^2 \text{ W}^{-1} \text{ Hz}^{-1/2}$  in barrier structures.**

**Keywords:**  $InSb$ ,  $Al_xIn_{1-x}Sb$ , homostructure, heterostructure, barrier structure, MWIR, photodetector, detectivity.

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